United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
Illinois Agricultural
Experiment Station

Soil Survey of Peoria County, Illinois



How To Use This Soil Survey

General Soil Map

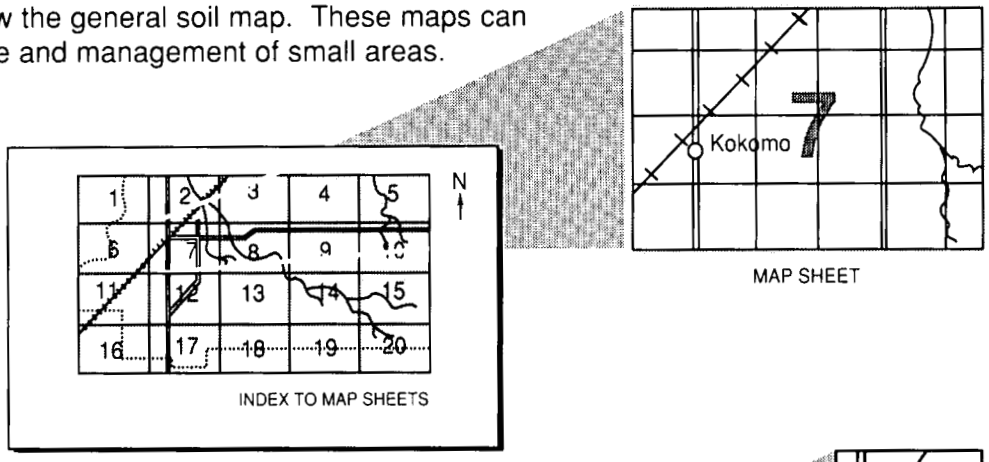
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

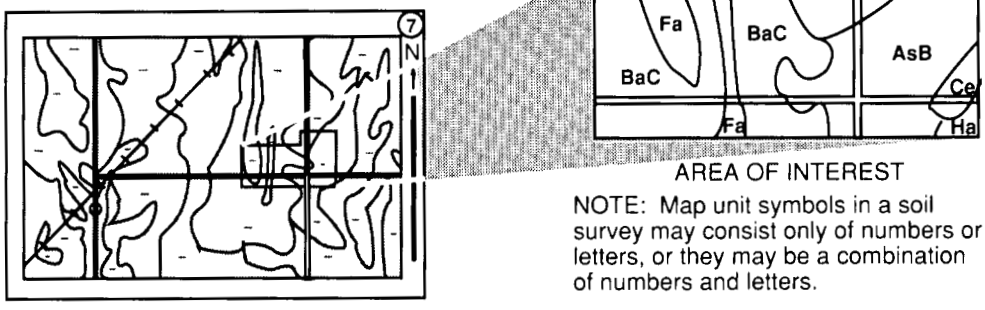
To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



INDEX TO MAP SHEETS

MAP SHEET

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET

AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in December 1984. Soil names and descriptions were approved in May 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1984. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Peoria County Soil and Water Conservation District. The cost was shared by the Peoria County Board and the Illinois Department of Agriculture.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This soil survey is Illinois Agricultural Experiment Station Soils Report 132.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: A pastured area of the stony, moderately steep to very steep Lenzburg soils. Water is in the end cut in this surface-mined area.

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Foreword

This soil survey contains information that can be used in land-planning programs in Peoria County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

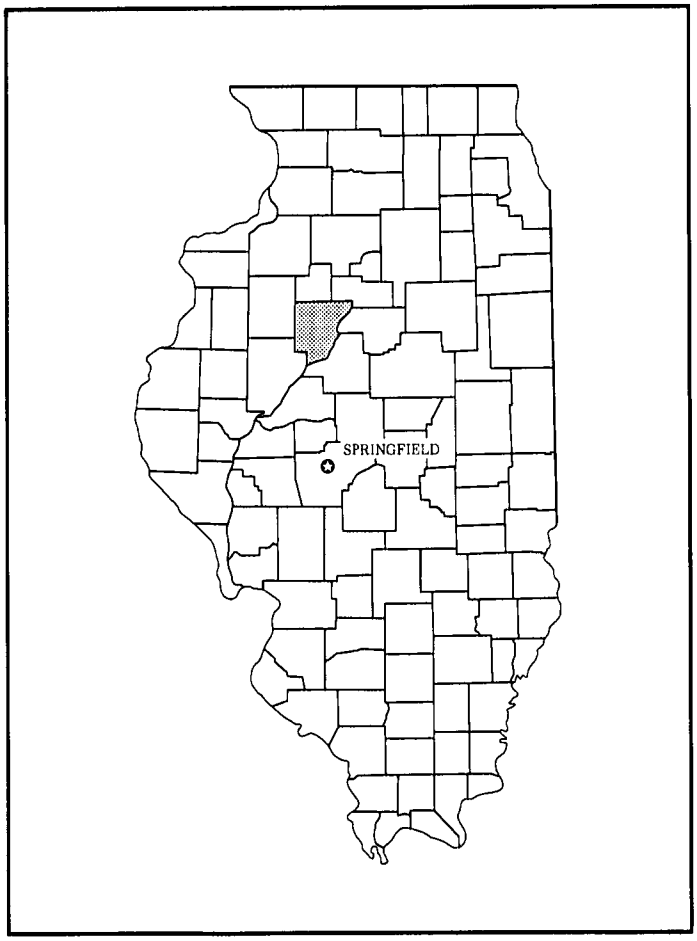
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow over bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.



Charles Whitmore
State Conservationist
Soil Conservation Service



Location of Peoria County in Illinois.

Soil Survey of Peoria County, Illinois

By Michael B. Walker, Soil Conservation Service

Soils surveyed by M.B. Walker, C.L. Love, and M.W. Bramstedt, Soil Conservation Service, and R.A. Leeper and M.J. Walczynski, Peoria County

United States Department of Agriculture, Soil Conservation Service,
in cooperation with
the Illinois Agricultural Experiment Station

General Nature of the County

PEORIA COUNTY is in the west-central part of Illinois. It has an area of 402,600 acres, or about 629 square miles. It is bordered on the north by Stark and Marshall Counties, on the west by Knox and Fulton Counties, on the south by Fulton County, and on the south and east, along the Illinois River, by Tazewell, Woodford, and Marshall Counties. In 1980, the population of the county was 200,466. Peoria, the county seat, had a population of 124,160.

This soil survey updates the surveys of Peoria County published in 1921 and 1937 and the survey of the Tri-County area published in 1972 *(6, 9, 11)*. It provides larger maps, which show the soils in greater detail.

Climate

Prepared by the Illinois State Water Survey, Champaign, Illinois.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Peoria in the period 1951 to 1980. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 21.5 degrees F and the average daily minimum temperature is 13.3 degrees. The lowest temperature on record, which occurred at Peoria in 1977, is -25 degrees. In July, the average temperature is 75.0 degrees and the average daily maximum temperature is 85.5 degrees. The highest recorded temperature, which occurred at Peoria in 1966, is 102 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 34.89 inches. Of this, 22.57 inches, or about 65 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 18.42 inches. The heaviest 1-day rainfall during the period of record was 4.43 inches at Peoria on June 2, 1980.

The average seasonal snowfall is 26.3 inches. The greatest snow depth at any one time during the period of record was 20 inches.

History and Development

In 1673, Louis de Joliet and Father Pere Jacques Marquette visited the area now known as Peoria County. They found Indians associated with the Peoria Tribe of the Algonquian Family living in a village on the bank of Upper Peoria Lake along the Illinois River. Robert Cavalier Sieur de LaSalle and Henri Tonti, part of a group of French voyageurs, visited the area in 1680. Fort St. Louis, along with a mission and village, was established in 1691 near the narrows at the head of Lower Peoria Lake.

Early settlements were tenuous, and there were probably short periods of French settlement between

1691 and 1760. By 1723, the French were extensively cultivating lands, particularly along Kickapoo Creek and other watercourses *(8)*. By 1778, the French and British had relinquished claim to the area. In 1825, Peoria County was established.

Pioneer farming was largely directed toward self-sufficiency. The current emphasis in agricultural production is on cash grain. Livestock are raised for supplemental income.

Diverse educational, economic, medical, cultural, and social institutions have been established in the county. In 1897, the college that became Bradley University was established in Peoria. Midstate College of Commerce and the University of Illinois College of Medicine are located at Peoria. Various hospitals, libraries, newspapers, and radio and television stations serve Peoria and the surrounding communities.

Natural Resources

Soil is a dominant natural resource in Peoria County. In 1982, the county had 1,161 farms, which made up 281,122 acres *(16)*. Corn and soybeans are the primary cultivated crops. Secondary farm products include winter wheat, oats, hay, vegetables, cattle, hogs, dairy products, sheep and wool, and poultry and poultry products.

About 25,000 acres in the county is woodland. Most of the woodland has been pastured and is along the major drainageways.

There are no natural lakes in the county. Manmade lakes and the Illinois River make up more than 9,000 acres of surface water. They provide opportunities for fishing and other recreational activities. Sunfish, bass, crappie, catfish, northern pike, and other fish inhabit these waters.

Subsurface natural resources in the county include water, coal, sand and gravel, and clay and shale. In and along the valley of the Illinois River, most ground water is drawn from an aquifer system referred to as Sankoty Sand. This aquifer consists of unconsolidated glacial deposits of Wisconsinan age, including loess and alluvium. Away from the Illinois River, most of the ground water is obtained from local deposits of sand and gravel or from the underlying Pennsylvanian bedrock aquifers consisting of sandstone, coal, and fractured shale *(4)*.

The amount of coal in the county that can be removed economically by surface mining is estimated to be 642,240 tons *(12)*. Currently, one surface mining enterprise is active in the county. A large quantity of sand and gravel of commercial importance is deposited mainly along the Illinois River and Kickapoo Creek *(3)*. Sampling has indicated that some clay and shale deposits can be used in the manufacture of building materials *(10)*.

Transportation Facilities

The transportation facilities available in Peoria County include an interstate highway, railroads, barges, and airports. Interstate Highway 74 and U.S. Highways 150 and 24 cross the county. Several state and county roads also provide important transportation links. Many of the industries located along the Illinois River are served by barges. Two airports in the Peoria vicinity offer commercial flights.

Relief, Physiography, and Drainage

Peoria County was repeatedly covered by glacial ice during the Pliestocene *(17)*. Most of the present surface materials and landforms are the result of the two most recent glacial stages, the Illinoian and the Wisconsin.

The Illinoian glacier covered the entire county, while the more recent Wisconsin glacier covered only the northeastern part. During its advance, each glacier modified the previously existing landscape and, in retreat, left a deposit of glacial drift. In upland areas, the glacial drift has been subsequently covered by windblown silt, known as loess. Moraines occur as gently undulating ridges in the portion of Peoria County once covered by the Wisconsin glacier. They are separated by wide, nearly level till plains or outwash plains. Moraines are not apparent on the Illinoian till plain. Major areas of bottom land are along Kickapoo Creek and the Illinois River. Terraces of glacial outwash are along the Illinois River. They are in areas reworked by the wind into dune-shaped landforms.

The county is in the drainage basin of the Illinois River. The northwestern part is drained by the Spoon River, while Kickapoo Creek drains most of the other parts. About 31,500 acres near or adjacent to drainageways are subject to flooding. A system of levees is maintained along the Illinois River.

Elevation ranges from 828 feet above sea level near Lawn Ridge to about 440 feet above sea level where the Illinois River leaves the county.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of

crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and

management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are named and mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general soil map of Peoria County joins the published general soil maps of Fulton and Knox Counties. The names of the soil associations may differ slightly because of variations in the extent of the soils in each county. Though the names vary slightly, the associations represent similar landscape units that have similar soil properties and similar management requirements.

Nearly Level to Moderately Sloping, Poorly Drained to Well Drained Soils on Uplands and Stream Terraces

These soils are on till plains, upland plains, and stream terraces characterized by broad flats; low, broad ridges; and gently sloping and moderately sloping side slopes. They are used extensively for cultivated crops.

1. Sable-Ipava Association

Nearly level, poorly drained and somewhat poorly drained, silty soils; formed in loess

This association consists of soils on broad flats and low ridges. Shallow depressions and more sloping ridges are in scattered areas throughout the association. The more sloping areas commonly are along narrow drainageways. Slope is 0 to 2 percent.

This association makes up 7 percent of the county. It is about 55 percent Sable soils, 30 percent Ipava soils, and 15 percent minor soils (fig. 1).

The poorly drained Sable soils are on broad flats and in drainageways below the Ipava soils. Typically, the surface layer is black, friable silty clay loam about 8 inches thick. The subsurface layer is black and very dark gray, firm silty clay loam about 14 inches thick. It is mottled in the lower part. The subsoil is mottled, firm silty clay loam about 24 inches thick. The upper part is olive gray. The lower part is light olive gray. The underlying material to a depth of 60 inches is gray, mottled, friable silt loam.

The somewhat poorly drained Ipava soils are on broad ridges above the Sable soils. Typically, the surface layer is very dark gray, friable silt loam about 10 inches thick. The subsurface layer also is very dark gray, friable silt loam. It is about 9 inches thick. The subsoil is about 32 inches thick. It is mottled. The upper part is brown, friable silty clay loam. The next part is brown, firm silty clay. The lower part is light olive brown, firm silty clay loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam.

Minor in this association are the poorly drained Denny soils in shallow depressions and the moderately well drained Tama soils on side slopes bordering drainageways and on ridges above the major soils.

Most areas are cultivated. The soils are well suited to the crops commonly grown in the county. Corn, soybeans, and small grain grow well. The content of organic matter is high in both of the major soils. Available water capacity is very high in the Sable soils and high in the Ipava soils. The main management needs are measures that maintain the drainage system, tilth, and fertility.

2. Ipava-Tama-Elkhart Association

Nearly level to moderately sloping, somewhat poorly drained and moderately well drained, silty soils; formed in loess

This association consists mainly of soils on ridges and side slopes along shallow drainageways. Slopes

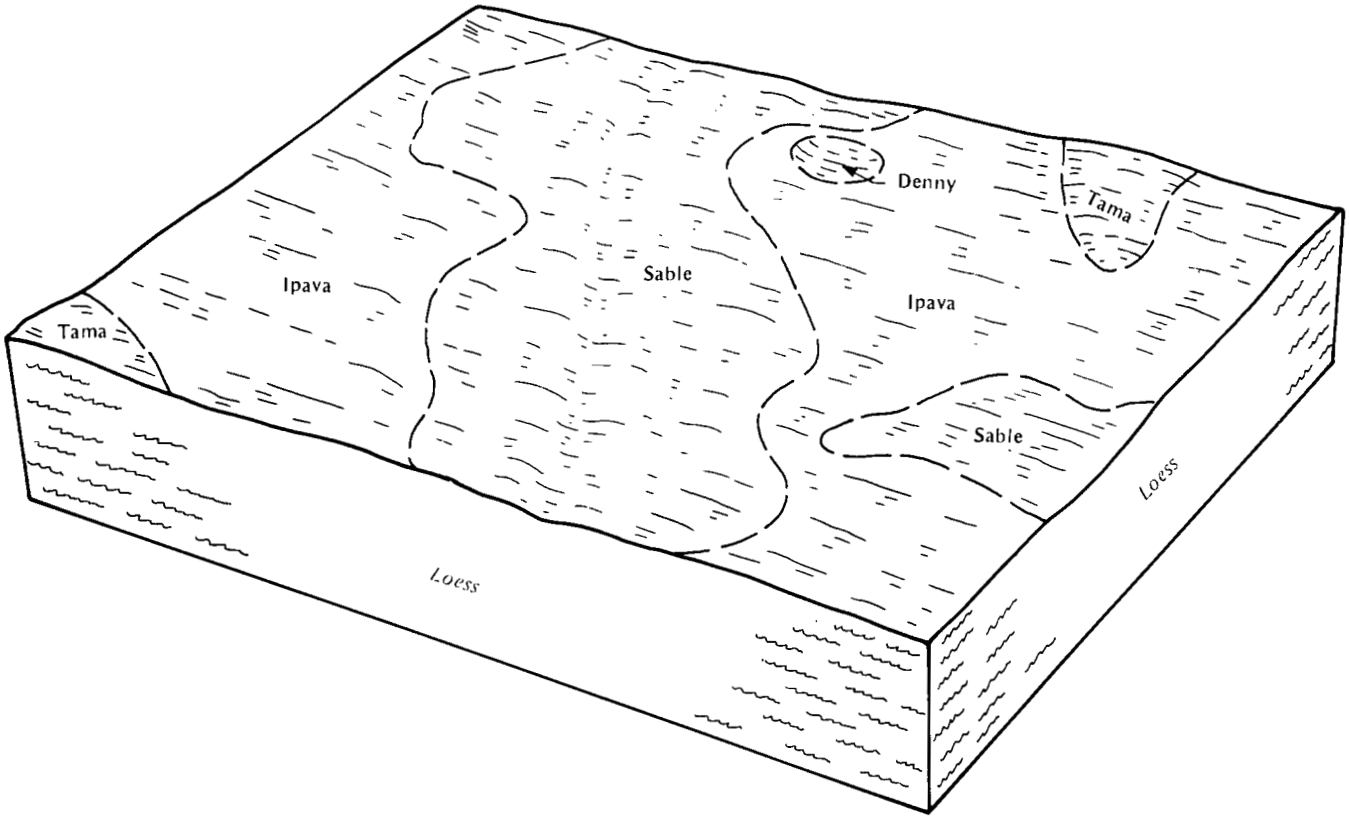


Figure 1.—Typical pattern of soils and parent material in the Sable-Ipava association.

are generally long and smooth. Along drainageways, however, they are shorter. They range from 0 to 10 percent.

This association makes up about 25 percent of the county. It is about 39 percent Ipava soils, 28 percent Tama and similar soils, 17 percent Elkhart soils, and 16 percent minor soils (fig. 2).

The nearly level, somewhat poorly drained Ipava soils are on ridges between drainageways. Typically, the surface layer is very dark gray, friable silt loam about 10 inches thick. The subsurface layer also is very dark gray, friable silt loam. It is about 9 inches thick. The subsoil is about 32 inches thick. It is mottled. The upper part is brown, friable silty clay loam. The next part is brown, firm silty clay. The lower part is light olive brown, firm silty clay loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam.

The gently sloping and moderately sloping, moderately well drained Tama soils are on ridges and side slopes along drainageways. Typically, the surface layer is very dark grayish brown, friable silt loam about 11 inches thick. The subsurface layer is dark brown, friable silt loam about 5 inches thick. The subsoil is about 37 inches thick. It is friable. The upper part is brown silty clay loam. The next part is dark yellowish brown silty clay loam. The lower part is yellowish brown, mottled silty clay loam and silt loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable silt loam.

The gently sloping and moderately sloping, moderately well drained Elkhart soils are on side slopes along drainageways and at the head of drainageways. Typically, the surface layer is mixed very dark grayish brown and brown, friable silty clay loam about 8 inches thick. It has been thinned by erosion. The subsoil is about 31 inches thick. The upper part is brown, friable silty clay loam. The next part is yellowish brown, firm silty clay loam. The lower part is yellowish brown, mottled, calcareous friable silt loam. The underlying material to a depth of 60 inches is brown, mottled, calcareous, friable silt loam.

Minor in this association are the poorly drained Denny and Sable, moderately well drained Assumption, and well drained Saybrook soils. Denny and Sable soils are in depressions and drainageways below the major

soils. Assumption and Saybrook soils are in positions on side slopes similar to those of the Tama and Elkhart soils.

This association is used mainly for cultivated crops. It is generally well suited to the cultivated crops commonly grown in the county. Corn, soybeans, and small grain grow well. The content of organic matter is high in the Ipava soils and moderate in the Tama and Elkhart soils. Available water capacity is high in the Ipava soils and very high in the Tama and Elkhart soils. The main management needs are measures that maintain the drainage system in the Ipava soils, that control water erosion on the Tama and Elkhart soils, and that maintain tilth and fertility in all of the major soils.

3. Proctor-Elburn-Drummer Association

Nearly level to moderately sloping, well drained, somewhat poorly drained, and poorly drained, silty soils; formed in loess over outwash

This association consists of soils on the side slopes of low to prominent ridges that are separated by soils on broad to narrow flats and in depressions and drainageways.

This association makes up about 3 percent of the county. It is about 35 percent Proctor and similar soils, 22 percent Elburn and similar soils, 22 percent Drummer and similar soils, and 21 percent minor soils.

The gently sloping and moderately sloping, well drained Proctor soils are on side slopes and ridgetops above the Drummer and Elburn soils. Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 3 inches thick. The subsoil is about 35 inches thick. The upper part is dark yellowish brown and yellowish brown, friable silty clay loam. The next part is yellowish brown, friable loam. The lower part is strong brown, stratified, very friable loam and sandy loam. The underlying material to a depth of 60 inches is strong brown, stratified, very friable sandy loam and loamy sand.

The nearly level, somewhat poorly drained Elburn soils are on slight rises below the Proctor soils and above the Drummer soils. Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 8 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper part is brown, friable

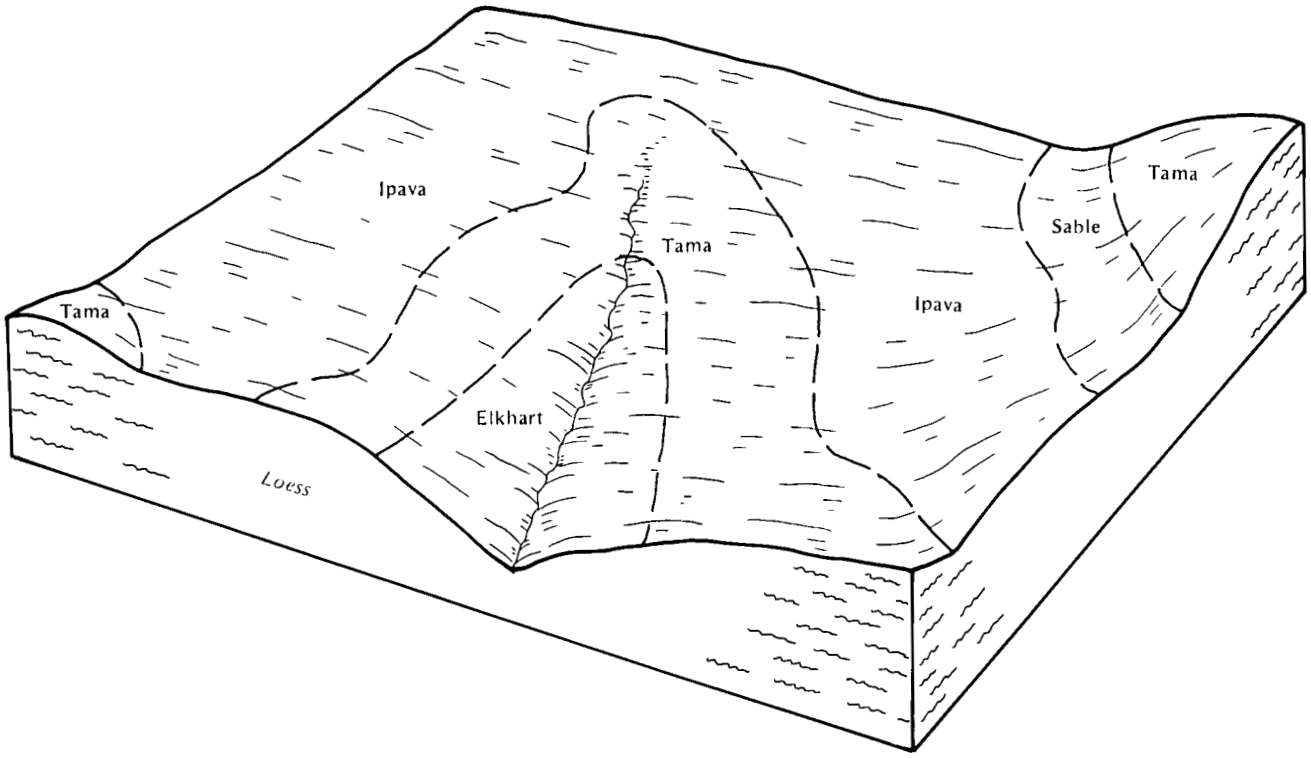


Figure 2.—Typical pattern of soils and parent material in the Ipava-Tama-Elkhart association.

silty clay loam. The next part is grayish brown, firm and friable silty clay loam. The lower part is light brownish gray, friable loam.

The nearly level, poorly drained Drummer soils are on flats and in shallow depressions and drainageways below the Elburn and Proctor soils. Typically, the surface layer is black, friable silty clay loam about 7 inches thick. The subsurface layer is friable silty clay loam about 15 inches thick. It is black in the upper part and very dark gray and mottled in the lower part. The subsoil is about 32 inches thick. It is mottled. The upper part is light yellowish brown, dark gray, and grayish brown, friable silty clay loam. The lower part is dark grayish brown, stratified, friable loam and sandy loam. The underlying material to a depth of 60 inches is grayish brown, mottled, stratified, friable sandy loam and loamy sand.

Minor in this association are the Catlin, Harpster, Ipava, Lisbon, Plano, and Sable soils. The moderately well drained Catlin and well drained Plano soils are in areas closely intermingled with the Proctor soils. The poorly drained Harpster and Sable soils are in areas closely intermingled with the Drummer soils. The somewhat poorly drained Ipava and Lisbon soils are in areas closely intermingled with the Elburn soils.

Most areas of this association are used for cultivated crops. The soils are generally well suited to all of the cultivated crops commonly grown in the county. The content of organic matter is high in the Drummer and Elburn soils and moderate in the Proctor soils. Available water capacity is high in the Proctor and Elburn soils and very high in the Drummer soils. The main management needs are measures that control water erosion in areas of the Proctor soils, that maintain the drainage system in areas of the Drummer and Elburn soils, and that maintain tilth and fertility in all of the major soils.

Nearly Level to Very Steep, Well Drained to Somewhat Poorly Drained Soils on Uplands

These soils are on uplands characterized by nearly level and gently sloping ridges that are dissected by drainageways. The side slopes along the drainageways are gently sloping to very steep. The soils are used mainly for pasture, hay, or woodland. Some areas are used for cultivated crops.

4. Rozetta-Keomah-Sylvan Association

Nearly level to strongly sloping, somewhat poorly drained to well drained, silty soils; formed in loess

This association consists of soils on uplands incised by narrow drainageways. The soils are nearly level and gently sloping on ridges and gently sloping to strongly sloping on side slopes. Slopes are generally short and smooth.

This association makes up about 37 percent of the county. It is about 46 percent Rozetta and similar soils, 15 percent Keomah soils, 14 percent Sylvan soils, and 25 percent minor soils (fig. 3).

The gently sloping and moderately sloping, moderately well drained Rozetta soils are on ridgetops and side slopes. Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsurface layer is yellowish brown, friable silt loam about 5 inches thick. The subsoil is about 46 inches thick. The upper part is yellowish brown, firm silty clay loam. The next part is yellowish brown and dark yellowish brown, mottled, firm silty clay loam. The lower part is yellowish brown, mottled, firm silt loam. The underlying material to a depth of 60 inches also is yellowish brown, mottled, firm silt loam.

The nearly level, somewhat poorly drained Keomah soils are on broad ridgetops. Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown, mottled, friable silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled and friable. The upper part is grayish brown silt loam. The next part is brown and grayish brown silty clay loam. The lower part is yellowish brown silt loam.

The moderately sloping and strongly sloping, moderately well drained and well drained Sylvan soils are on side slopes. Typically, the surface layer is mixed brown, yellowish brown, and light brownish gray, friable silty clay loam about 6 inches thick. The subsoil is about 27 inches thick. It is yellowish brown and mottled. The upper part is firm silty clay loam. The lower part is friable silt loam. The underlying material to a depth of 60 inches is mottled light brownish gray and yellowish brown, calcareous, friable silt loam.

Minor in this association are the Dodge, Fayette, Hickory, Rushville, Strawn, and Marseilles soils. The well drained Dodge, Fayette, Hickory, and Strawn soils and the moderately well drained Marseilles soils are on side slopes at the head of drainageways. Hickory and Strawn soils have more sand in the subsoil than the major soils. Marseilles soils have bedrock within a depth of 40 inches. Rushville soils are in depressions below the major soils.

Most areas of this association are used for cultivated crops, pasture, or hay. The nearly level and gently sloping soils are suited to cultivated crops and to pasture and hay. The moderately sloping soils are moderately suited to cultivated crops. The main management needs are measures that control water erosion in the gently sloping and moderately sloping areas, that maintain the drainage system in the Keomah

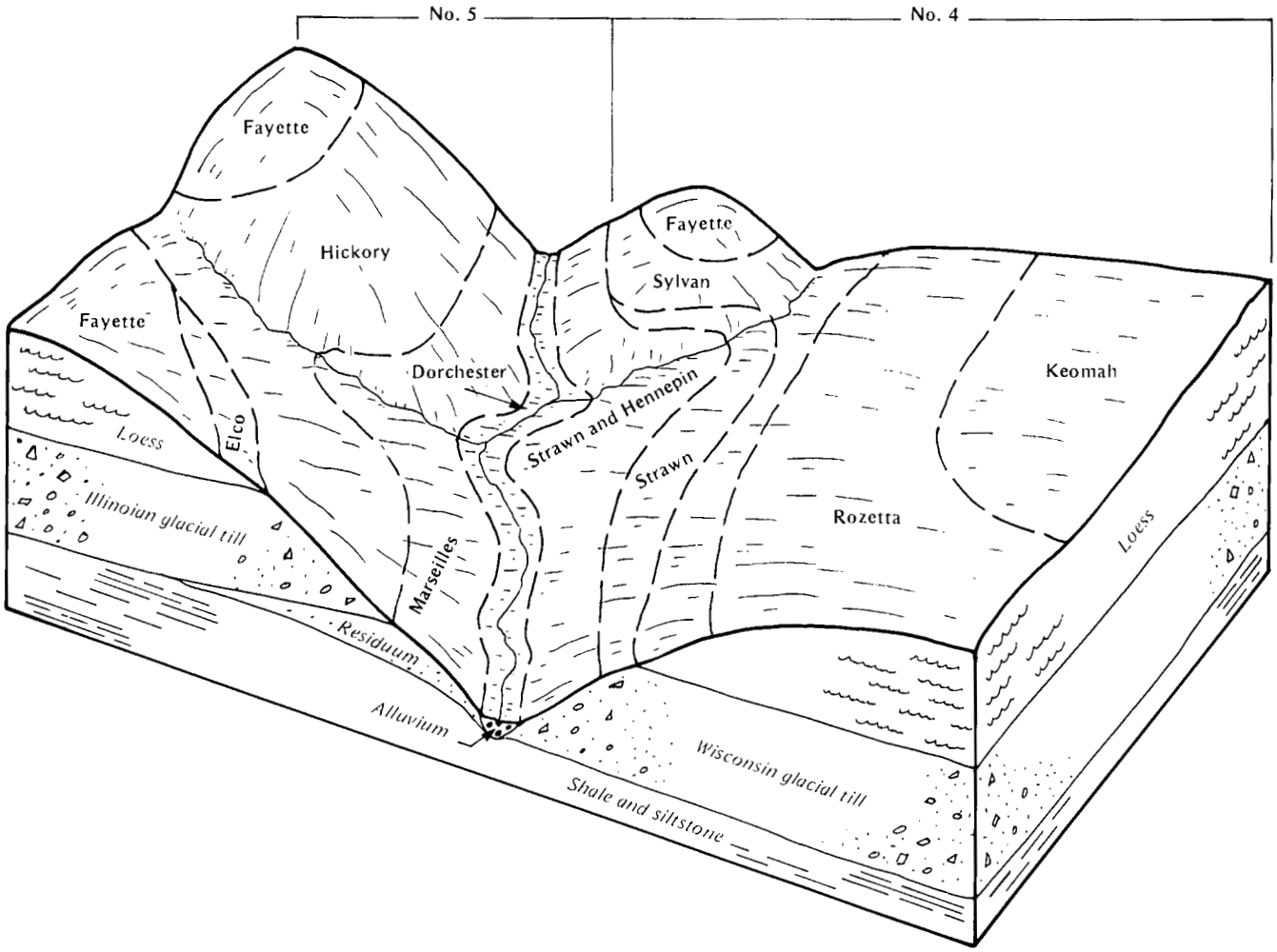


Figure 3.—Typical pattern of soils and parent material in the Rozetta-Keomah-Sylvan and Hickory-Strawn-Marseilles associations.

soils, and that maintain tilth and fertility in all of the major soils.

5. Hickory-Strawn-Marseilles Association

Strongly sloping to very steep, well drained and moderately well drained, silty and loamy soils; formed mainly in glacial till or in material weathered from shale

This association consists of soils on side slopes and foot slopes bordering stream valleys in the uplands. Small drainageways and the adjacent larger flood plains are in some areas.

This association makes up about 15 percent of the county. It is about 38 percent Hickory soils, 22 percent Strawn soils, 20 percent Marseilles soils, and 20 percent minor soils (fig. 3).

The moderately steep to very steep, well drained Hickory soils are on side slopes and foot slopes. They formed in glacial till or in loess over glacial till. Typically, the surface layer is dark grayish brown, friable loam or silt loam about 3 inches thick. The subsurface layer is brown, very friable loam about 4 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable clay loam. The next part is yellowish brown, firm clay loam. The lower part is light olive brown, friable loam.

The very steep, well drained Strawn soils are on side slopes. They formed in glacial till. Typically, the surface layer is very dark grayish brown, very friable silt loam about 5 inches thick. It is silty clay loam in severely eroded areas. The subsoil is about 19 inches thick. The upper part is brown and dark brown, friable silty clay loam. The lower part is brown, calcareous, friable clay loam. The underlying material to a depth of 60 inches or more is brown, calcareous, friable loam.

The moderately steep to very steep, moderately

deep, moderately well drained Marseilles soils are on side slopes and foot slopes. They formed in shale residuum mantled with loess. Typically, the surface layer is dark brown, friable silt loam about 6 inches thick. The subsurface layer is brown, friable silt loam about 4 inches thick. The subsoil is firm silty clay loam about 29 inches thick. The upper part is yellowish brown. The next part is yellowish brown and mottled. The lower part is olive and mottled. Light olive brown, soft shale is at a depth of about 39 inches.

Minor in this association are the Alvin, Dodge, Dorchester, Elco, Fayette, Hennepin, Lawson, and Sylvan soils. The well drained Alvin, Dodge, and Fayette soils, the moderately well drained Elco soils, and the well drained and moderately well drained Sylvan soils are on side slopes and narrow ridges, generally above the major soils. The well drained Dorchester and somewhat poorly drained Lawson soils are in areas below the major soils. The well drained Hennepin soils are in areas closely intermingled with the very steep Strawn soils.

Most areas of this association are used for woodland. Some moderately steep areas are used for pasture. The soils are moderately suited to woodland. Available water capacity is high in the Hickory soils and moderate in the Strawn and Marseilles soils. The main management needs are measures that control water erosion in disturbed areas and measures that protect the woodland from fire and grazing.

Nearly Level to Strongly Sloping, Well Drained and Excessively Drained Soils on Stream Terraces

These soils are on broad ridgetops and short terrace breaks. They are sandy in some part of the profile and have a low or moderate available water capacity. They are used mainly for cultivated crops, but large areas are used for building site development.

6. Warsaw-Dickinson-Plainfield Association

Nearly level to strongly sloping, well drained and excessively drained, loamy, silty, and sandy soils; formed in outwash and in drift

This association consists of nearly level to strongly sloping soils on the crests and side slopes of ridges and dunes on stream terraces. The difference in elevation between the terraces and the adjacent flood plains ranges from about 25 to 75 feet.

This association makes up about 4 percent of the county. It is about 41 percent Warsaw and similar soils, 22 percent Dickinson soils, 14 percent Plainfield soils, and 23 percent minor soils (fig. 4).

The nearly level, well drained Warsaw soils are on broad flats. They formed in loamy outwash and are underlain by sand and gravel within a depth of 40 inches. Typically, the surface layer is very dark grayish brown, very friable silt loam about 8 inches thick. The subsurface layer also is very dark grayish brown, very friable silt loam about 8 inches thick. The subsoil is about 19 inches thick. It is dark brown. The upper part is very friable silty clay loam. The lower part is firm gravelly clay loam. The underlying material to a depth of 60 inches is dark yellowish brown, coarsely stratified, calcareous, loose very gravelly sand and sand.

The gently sloping, well drained Dickinson soils are on convex side slopes and ridgetops. They formed in loamy and sandy outwash. Typically, the surface layer is very dark grayish brown, friable sandy loam about 9 inches thick. The subsurface layer is very dark grayish brown, friable fine sandy loam about 6 inches thick. The subsoil is about 24 inches thick. The upper part is brown, friable fine sandy loam. The next part is brown, very friable loamy sand. The lower part is brown, very friable sand. The underlying material to a depth of 60 inches is brown, loose sand.

The moderately sloping and strongly sloping, excessively drained Plainfield soils are on the crests and side slopes of dunes. They formed in sandy drift. Typically, the surface layer is dark brown, very friable loamy sand about 8 inches thick. The subsoil is brown and strong brown, very friable sand about 23 inches thick. The underlying material to a depth of 60 inches is strong brown, loose sand.

Minor in this association are the Beaucoup and Worthen soils. The poorly drained Beaucoup soils are in low areas and are subject to flooding and ponding. The well drained Worthern soils commonly are on side slopes adjacent to the uplands. They do not have sand or gravel within a depth of 60 inches.

Most areas of this association are used for cultivated crops. The Warsaw soils are well suited to corn, soybeans, and small grain; the Dickinson soils are moderately suited; and the Plainfield soils are poorly suited or generally unsuited. Organic matter content is moderate in the Warsaw soils, moderately low in the Dickinson soils, and low in the Plainfield soils. Available water capacity is moderate in the Warsaw soils and low in the Dickinson and Plainfield soils. It is a limitation in areas used for cultivated crops. The main management needs are measures that control soil blowing and water erosion, maintain fertility, and conserve moisture.

Nearly Level and Gently Sloping, Well Drained, Somewhat Poorly Drained, and Poorly Drained Soils on Flood Plains and Stream Terraces

These soils are on broad flood plains along the Illinois River, on the narrower bottom land along tributary streams, and on stream terraces. The

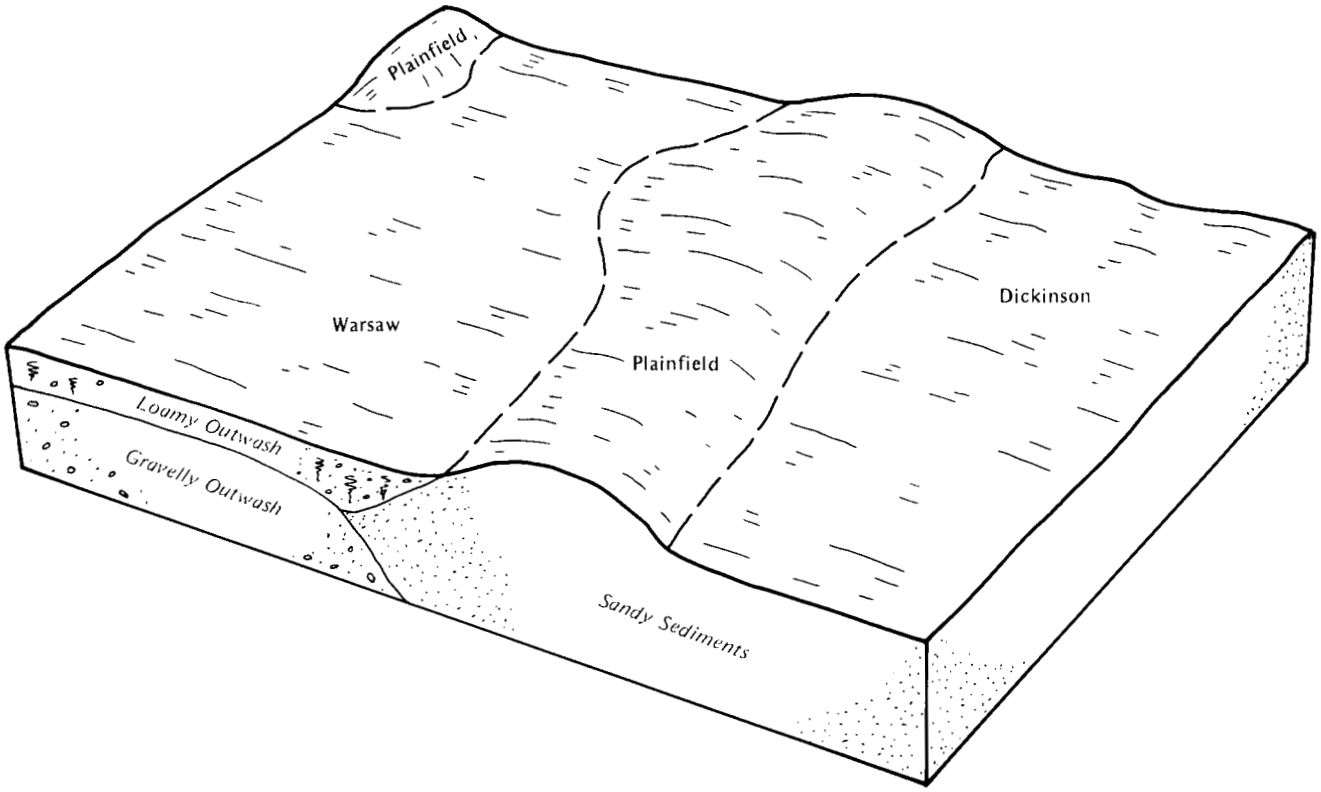


Figure 4.—Typical pattern of soils and parent material in the Warsaw-Dickinson-Plainfield association.

landscape is characterized by slight rises, natural levees, and broad flats. Some areas are protected from flooding by a levee system and are used extensively for cultivated crops. Unprotected areas are used for cultivated crops or woodland.

7. Dorchester-Landes Association

Nearly level and gently sloping, well drained, loamy and silty soils; formed in alluvium

This association consists of soils on flood plains and stream terraces. These soils are subject to rare or frequent flooding for very brief or brief periods.

This association makes up about 1 percent of the county. It is about 52 percent Dorchester soils, 38 percent Landes soils, and 10 percent minor soils.

The nearly level Dorchester soils are frequently flooded for very brief periods. They formed in silty alluvium. Typically, the surface layer is dark grayish brown, calcareous, friable silt loam about 9 inches thick. The underlying material extends to a buried soil at a depth of about 32 inches. It is stratified dark grayish brown, brown, very dark gray, and very dark grayish brown, calcareous, friable silt loam that has thin strata of loam. The buried soil to a depth of 60 inches is black and very dark gray, friable silt loam. It is mottled in the lower part.

The gently sloping Landes soils are subject to rare flooding. They formed in loamy and sandy alluvium. Typically, the surface layer is very dark brown, friable loam about 8 inches thick. The subsurface layer is dark brown, friable loam about 5 inches thick. The subsoil is about 25 inches thick. It is dark brown and calcareous. The upper part is friable loam. The lower part is very friable fine sandy loam. The underlying material to a depth of 60 inches is dark brown, calcareous, stratified, very friable sandy loam and loamy sand.

Minor in this association are the Beaucoup, Huntsville, Jules, and Paxico soils. The poorly drained Beaucoup soils are on broad flats and in sloughs below the major soils. Huntsville soils are occasionally flooded. The well drained Jules and somewhat poorly drained Paxico soils are on flats near ditches or channels.

Most areas of this association are used for cultivated crops. The soils are generally well suited to the cultivated crops commonly grown in the county. Organic matter content is low in the Dorchester soils and

moderately low in the Landes soils. Available water capacity is very high in the Dorchester soils and moderate in the Landes soils. Flooding is a hazard in the nearly level areas. In the more sloping areas, measures that help to control soil blowing and water erosion, conserve moisture, and maintain tilth and fertility are needed.

8. Jules-Paxico-Lawson Association

Nearly level, well drained and somewhat poorly drained, silty soils; formed in alluvium

This association consists of soils on swells and in low areas on flood plains. Relief generally is 5 feet or less, though some slopes are very short and abrupt in areas where the flood plains are adjacent to terraces. These soils are frequently flooded for brief periods.

This association makes up about 4 percent of the county. It is about 35 percent Jules soils, 32 percent Paxico soils, 24 percent Lawson soils, and 9 percent minor soils.

The well drained Jules soils are on flats and slight rises. Typically, the surface layer is mixed dark grayish brown and yellowish brown, calcareous, friable silt loam about 8 inches thick. The underlying material to a depth of 60 inches is stratified dark grayish brown, very dark grayish brown, brown, and yellowish brown, calcareous, friable silt loam that has thin strata of loam, very fine sandy loam, and loamy sand.

The somewhat poorly drained Paxico soils are on broad flats or on slight rises. Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The underlying material to a depth of 60 inches is dark grayish brown, brown, dark yellowish brown, and grayish brown, mottled, calcareous, and friable and very friable. It is dominantly silt loam but has thin strata of loam and fine sandy loam in the lower part.

The somewhat poorly drained Lawson soils are on slight rises. Typically, the surface layer is very dark gray, very friable silt loam about 9 inches thick. The subsurface layer is black, very dark gray, and very dark grayish brown, friable silt loam about 36 inches thick. It is mottled in the lower part. The underlying material to a depth of 60 inches is grayish brown, mottled, friable silt loam.

Minor in this association are the well drained Dorchester and somewhat poorly drained Orion soils near the upland bluffs, the well drained Huntsville soils near streams, the well drained Worthen soils on low terraces, and the poorly drained Sawmill soils in low areas below the major soils.

Most areas of this association are used for cultivated crops. Some are used for hay, pasture, or woodland. The soils generally are suited to the cultivated crops commonly grown in the county. The content of organic matter is moderately low in the Jules and Paxico soils and high in the Lawson soils. Available water capacity is high in the Jules and Paxico soils and very high in the Lawson soils. The main management needs are measures that protect crops from floodwater, that maintain the drainage system, and that maintain tilth and fertility.

9. Beaucoup-Titus Association

Nearly level, poorly drained, silty soils; formed in alluvium

This association consists of soils on flood plains characterized by broad low areas. Relief is 5 feet or less. Flooding is rare because the association is protected by a system of levees.

This association makes up about 1 percent of the county. It is about 49 percent Beaucoup soils, 34 percent Titus soils, and 17 percent minor soils.

Typically, the surface layer of the Beaucoup soils is very dark gray, mottled, friable silty clay loam about 7 inches thick. The subsurface layer also is very dark gray, mottled, friable silty clay loam. It is about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled and friable. It is dominantly silty clay loam but has thin strata of silt loam in the lower part. The upper part is very dark gray. The next part is dark gray. The lower part is grayish brown.

Typically, the surface layer of the Titus soils is very dark gray, firm silty clay loam about 7 inches thick. The subsurface layer is very dark gray, mottled, firm silty clay about 5 inches thick. The subsoil is about 34 inches thick. It is dark gray and gray, mottled, and firm. The upper part is silty clay. The lower part is silty clay loam. The underlying material to a depth of 60 inches is light olive gray, mottled, stratified, calcareous, friable silt loam and loam.

Minor in this association are the Jules, Landes, Sarpy, and Paxico soils. The well drained Landes and Jules and excessively drained Sarpy soils are on slight rises above the major soils. The somewhat poorly drained Paxico soils are in low areas near streams.

Most areas of this association are used for cultivated crops. The soils generally are suited to the cultivated crops commonly grown in the county and to pasture and hay. Areas unprotected by levees are idle because of a severe hazard of flooding. The content of organic matter is high in the Beaucoup soils and moderate in the Titus soils. Available water capacity is high in both soils. The main management needs are measures that maintain the levees, the drainage system, and tilth and fertility.

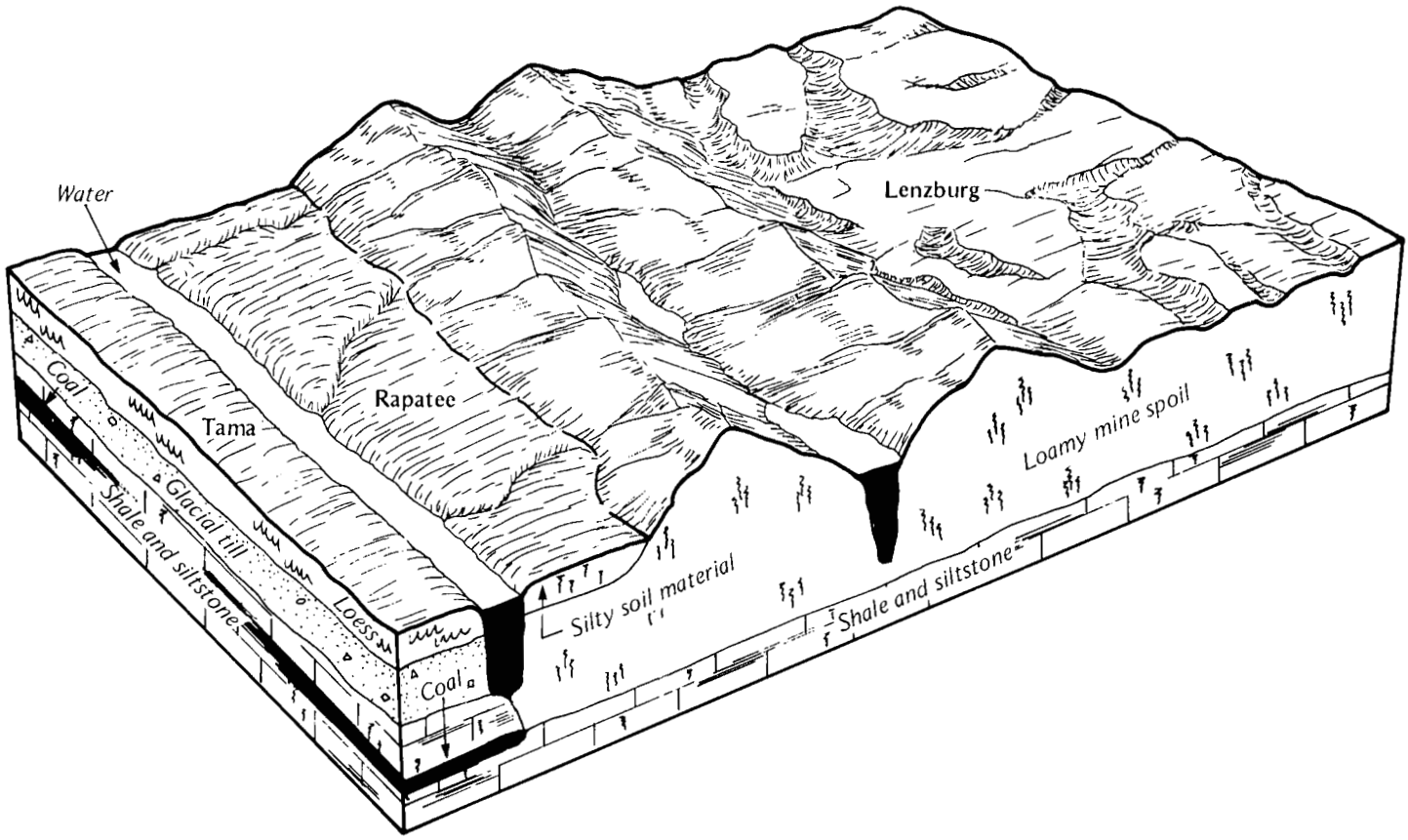


Figure 5.—Typical pattern of soils and parent material in the Lenzburg-Rapatee association.

Gently Sloping to Very Steep, Well Drained Soils in Surface-Mined Areas

These soils are on uplands and in protected areas on flood plains. The landscape is characterized by rugged parallel ridges in the less recently mined areas and by gently sloping and moderately sloping terrain in the more recently mined areas that have been reclaimed. Most of the less recently mined areas have common large stones and a few boulders on the surface.

10. Lenzburg-Rapatee Association

Gently sloping to very steep, well drained, silty soils; formed in mine spoil and in replaced soil material underlain by mine spoil

This association consists of soils on high parallel ridges and in swales where little or no grading has reclaimed the landscape and on gently sloping and moderately sloping plains and ridges that have been reclaimed. Numerous scattered water areas, many less than 2 acres in size, are throughout the association.

This association makes up about 3 percent of the county. It is about 69 percent Lenzburg soils, 10 percent Rapatee soils, and 21 percent minor soils (fig. 5).

The strongly sloping to very steep Lenzburg soils are in areas of mine spoil where grading has been limited, and the gently sloping ones are in areas that have been graded. Typically, the surface layer is grayish brown, calcareous, firm silt loam about 3 inches thick. Stones are about 25 to 50 feet apart on the surface. The underlying material to a depth of 60 inches is multicolored, calcareous, firm silty clay loam. It is mottled in the lower part. Shale channers are common throughout the profile.

The gently sloping and moderately sloping Rapatee soils are in surface-mined areas where the mine spoil has been covered with the dark surface layer of the original soils. Typically, the surface layer is mixed very dark gray and light yellowish brown, friable silt loam or silty clay loam about 4 inches thick. The upper part of the underlying material is the original surface soil material. It is mixed black and light yellowish brown, firm silt loam about 11 inches thick. The lower part to a

depth of 60 inches is mine spoil of light olive and dark greenish gray, calcareous, very firm and firm silt loam and silty clay loam.

Minor in this association are the Elco, Hickory, Marseilles, and Tama soils. These soils are in areas that have not been mined.

Most areas of this association are wooded, used for pasture, or developed for recreational uses. The reclaimed areas are used for cultivated crops. Organic matter content and available water capacity vary, depending on the extent of reclamation. The main management needs are measures that control water erosion. The stones on the surface of the Lenzburg soils limit the use of equipment.

Broad Land Use Considerations

Approximately 53 percent of Peoria County is used for cultivated crops, mainly corn, soybeans, and wheat. About 6 percent is used for hay and pasture, and 6 percent is used for woodland. The suitability of the soils for these uses varies significantly.

Corn, soybeans, and wheat are grown extensively in areas of all the associations, except for association 5. Associations 1 to 4 and 6 to 10 generally are moderately suited or well suited to cultivated crops. Wetness is a limitation in the major soils that are nearly level or low lying, such as Beaucoup, Drummer, Ipava, Keomah, Lawson, Sable, and Titus soils. Also, flooding may occasionally damage crops in areas of Jules, Lawson, and Sawmill soils. The more sloping soils, such as Dickinson, Elkhart, Proctor, Rozetta, Sylvan, and Tama soils, are highly susceptible to water erosion. A cropping system that includes grasses and legumes, a conservation tillage system that leaves a protective amount of crop residue on the surface, or terraces are needed to control water erosion in areas of these soils. Plainfield soils have a low available water capacity and are subject to soil blowing.

Much of the hayland and pasture in the county is in areas of associations 4 and 10. The less sloping soils in these associations, such as Keomah, Sylvan, Rozetta, and Rapatee soils, are well suited to hay and pasture.

Most of the woodland in the county is in areas of associations 4, 5, 8, and 9. The hazard of water erosion and the equipment limitation affect the suitability of the steeper soils for woodland.

Dwellings and septic tank absorption fields are in areas of all the associations. Associations 7, 8, and 9 generally are unsuited to dwellings and septic tank absorption fields because of the hazard of flooding or ponding. Most of the major soils in associations 1, 3, and 5 are poorly suited to these uses because of wetness or ponding, a shrink-swell potential, slow or very slow permeability, or the slope. The major soils in association 6 are well suited or moderately suited to dwellings but are poorly suited to septic tank absorption fields because of a poor filtering capacity. The Elkhart soils and the less sloping Lenzburg, Rozetta, Sylvan, and Tama soils in associations 2, 4, and 10 are moderately suited to dwellings and septic tank absorption fields.

The suitability for the development of wildlife habitat is good throughout the county. All of the associations, except for association 8, are well suited to habitat for openland wildlife. Association 5 is well suited to habitat for woodland wildlife. Associations 8 and 9 are well suited to habitat for wetland wildlife in areas that are not protected from flooding.

The recreational areas in the county include camp and picnic areas, playgrounds, and paths and trails. The major soils in associations 7, 8, and 9 are poorly suited to these uses because of wetness and the hazard of flooding. Areas of the other associations are suitable for some recreational uses, although some of the major soils are limited by wetness, ponding, slope, and slow or very slow permeability.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series.* Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Hickory silt loam, 8 to 15 percent slopes, is a phase of the Hickory series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Tama-Urban land complex, 1 to 5 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas.* Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

In some areas the detailed maps of Peoria County do not exactly join those in Knox County. Differences result from refinements in series concepts and variations in the extent of individual soils in the map units. The soils in these map units have similar properties and similar potential for major land uses. The differences in map unit names do not significantly affect the use and management of the soils.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

8D—Hickory silt loam, 8 to 15 percent slopes. This strongly sloping, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 3 to 95 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 3 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 4 inches thick. The subsoil extends to a depth of more than 60 inches. It is yellowish brown. The upper part is friable loam. The lower part is firm clay loam. In some areas the surface layer is darker and thicker. In other areas the slope is more than 15 percent.

Included with this soil in mapping are small areas of the moderately well drained Marseilles soils. These soils have bedrock within a depth of 40 inches. They

are on the lower side slopes. They make up 5 to 10 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

In most areas this soil is cultivated. It is moderately suited to cultivated crops, pasture, hay, dwellings, and septic tank absorption fields. It is very well suited to woodland.

Water erosion is a hazard if this soil is used for corn, soybeans, or small grain. Also, deterioration of tilth is a problem. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to control water erosion. Stripcropping also helps to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted forage and hay crops grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope and the shrink-swell potential are limitations. Cutting and filling help to overcome the slope. Extending foundation footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The moderate permeability and the slope are limitations if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderate permeability. Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.

The land capability classification is IIIe.

8E—Hickory silt loam, 15 to 30 percent slopes. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 3 to 205 acres in size.

Typically, the surface layer is brown, friable silt loam about 3 inches thick. The subsurface layer is yellowish brown, friable loam about 4 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable silt loam. The lower part is strong brown, yellowish brown, and brown, firm clay loam. In some areas the surface layer is thicker and darker. In other areas brown loamy sand is within a depth of 60 inches. In places the subsoil formed in material weathered from siltstone and shale.

Included with this soil in mapping are small areas of the well drained Dorchester soils. These soils formed in alluvium in drainageways and are subject to flooding. They make up 5 to 10 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are used as woodland (fig. 6). Some are used for pasture and hay. This soil is well suited to woodland and to woodland wildlife habitat. It is moderately suited to pasture and hay. It is generally unsuitable as a site for dwellings and septic tank absorption fields because of the slope.

Establishing pasture and hay crops helps to control water erosion. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing causes surface compaction and excessive runoff and water erosion. Proper stocking rates and timely deferment of grazing help to prevent overgrazing. A no-till method of seeding or pasture renovation helps to control water erosion. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, the hazard of water erosion and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs and trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of



Figure 6.—A wooded area of Hickory silt loam, 15 to 30 percent slopes.

the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is VIe.

8G—Hickory loam, 30 to 50 percent slopes. This very steep, well drained soil is on side slopes in the uplands. Individual areas are long and irregular in shape and range from 4 to 390 acres in size.

Typically, the surface layer is dark grayish brown, friable loam about 3 inches thick. The subsurface layer is brown, very friable loam about 4 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable clay loam. The next part is yellowish brown, firm clay loam. The lower part is light olive brown, friable loam. In some areas the subsoil contains less clay and is calcareous within a depth of 20 inches. In other areas the surface layer is thicker and darker. In some places brown loamy sand is within a depth of 60 inches. In other places the lower part of the subsoil formed in material weathered from siltstone or shale.

Included with this soil in mapping are small areas of

the somewhat poorly drained Lawson soils, which formed in alluvium and are in drainageways that are subject to flooding. Also included, on the lower part of the slopes, are areas where bedrock is at the surface. Included areas make up 5 to 10 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

Most areas are used as woodland. This soil is well suited to woodland and to habitat for woodland wildlife. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the slope.

If this soil is used as woodland, the hazard of water erosion and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs and trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

Trees and shrubs can be easily established on this soil. The existing stands of trees provide good habitat for woodland wildlife. Protection from fire and grazing helps to prevent depletion of the shrubs and sprouts that provide food and cover for the wildlife.

The land capability classification is VIIe.

16—Rushville silt loam. This nearly level, poorly drained soil is in depressions on uplands. It is occasionally ponded for brief periods in spring. Individual areas are round or irregularly shaped and range from 3 to 45 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer is gray, very friable silt about 5 inches thick. The subsoil is about 35 inches thick. It is firm and mottled. The upper part is grayish brown silty clay loam. The next part is grayish brown silty clay. The lower part is light brownish gray silty clay loam. The underlying material to a depth of 60 inches is gray, mottled silt loam. In places the surface layer is darker.

Included with this soil in mapping are small areas of the somewhat poorly drained Clarksdale and Keomah soils. These soils are not subject to ponding and are on slight rises above the Rushville soil. They make up 5 to 10 percent of the unit.

Water and air move through the Rushville soil at a very slow rate. Surface runoff is slow to ponded in cultivated areas. A perched seasonal high water table is 1 foot above the surface to 1 foot below during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops, pasture, and hay. It is generally unsuitable as a site for dwellings and septic tank absorption fields because of the ponding and the very slow permeability in the subsoil. It is well suited to habitat for wetland wildlife.

In most areas this soil can be used for corn, soybeans, or small grain because a drainage system has been installed. Measures that maintain the drainage system are needed. A system of shallow surface ditches and tile inlets is needed. Tile drains do not function well because of the very slow permeability. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.

If this soil is used for pasture and hay, the ponding is a hazard. It can be controlled by subsurface drains and surface inlet tile. Canarygrass and alsike clover are suitable forage species. Deferment of grazing when the soil is too wet helps to prevent surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, and applications of fertilizer help to keep the pasture in good condition.

The land capability classification is IIIw.

17—Keomah silt loam. This nearly level, somewhat poorly drained soil is on broad ridgetops in the uplands. Individual areas are irregular in shape and range from 3 to 1,000 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown, mottled, friable silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled and friable. The upper part is grayish brown silt loam. The next part is brown and grayish brown silty clay loam. The lower part is yellowish brown silt loam. In some areas depth to the seasonal high water table is more than 4 feet. In other

areas the surface layer is darker. In places the slope is more than 2 percent.

Included with this soil in mapping are small areas of the poorly drained Denny soils. These soils are in shallow depressions below the Keomah soil and are subject to ponding. They make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Keomah soil at a moderate rate and through the lower part at a slow or moderately slow rate. Surface runoff is slow. The seasonal high water table is 2 to 4 feet below the surface during spring. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is moderately suited to woodland. It is poorly suited to dwellings and septic tank absorption fields.

Most areas of this soil can be used for corn, soybeans, or small grain because a drainage system has been installed. Measures that maintain or improve the drainage system are needed. Subsurface tile drains are suitable if outlets are available. Keeping tillage to a minimum and leaving crop residue on the surface after planting help to maintain tilth and minimize crusting.

Climatically adapted forage and hay plants grow well on this soil. Bromegrass, orchardgrass, reed canarygrass, and red clover are suitable forage species. Subsurface tile drains can help to lower the seasonal high water table if suitable outlets are available. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The slow permeability and the seasonal high water table are limitations if this soil is used as a site for septic tank absorption fields. The septic tank system can function satisfactorily if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed.

The land capability classification is IIw.

19C3—Sylvan silty clay loam, 5 to 10 percent slopes, severely eroded. This moderately sloping, moderately well drained soil is on side slopes in the uplands. In most areas, nearly all of the original surface layer has been removed by water erosion and tillage has mixed the rest with the upper part of the subsoil. Individual areas are irregular in shape and range from 3 to 130 acres in size.

Typically, the surface layer is brown, mottled, friable silty clay loam about 9 inches thick. The subsoil is mottled, friable silty clay loam about 11 inches thick. The upper part is yellowish brown. The lower part is brown. The underlying material to a depth of 60 inches is light brownish gray, mottled, calcareous, friable silt loam. In some areas the soil has a thicker subsoil and is deeper to carbonates. In other areas the underlying material is loam glacial till.

Water and air move through this soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during spring. Available water capacity is very high. Organic matter content is low. The surface layer is mainly subsoil material, which puddles and crusts after periods of rainfall. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is poorly suited to cultivated crops. It is moderately suited to pasture and hay. It is well suited to woodland and to habitat for openland and woodland wildlife. It is moderately suited to dwellings and septic tank absorption fields.

Unless the surface is protected, further water erosion is a severe hazard in the areas used for corn, soybeans, or small grain. A system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, and a crop rotation that is dominated by forage crops help to control water erosion. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and water erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Seedbed preparation is difficult in severely eroded areas on side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further water erosion. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as a site for dwellings with

basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential and the slope are limitations on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting and filling help to overcome the slope.

The seasonal high water table and the moderate permeability are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderate permeability.

The land capability classification is IVe.

19D3—Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded. This strongly sloping, well drained soil is on side slopes in the uplands. In most areas, nearly all of the original surface layer has been removed by water erosion and tillage has mixed the rest with the upper part of the subsoil. Individual areas are irregular in shape and range from 3 to 65 acres in size.

Typically, the surface layer is mixed brown, yellowish brown, and light brownish gray, friable silty clay loam about 6 inches thick. The subsoil is about 27 inches thick. It is yellowish brown and mottled. The upper part is firm silty clay loam. The lower part is friable silt loam. The underlying material to a depth of 60 inches is mottled light brownish gray and yellowish brown, calcareous, friable silt loam. In some areas the soil has a thicker subsoil and is deeper to carbonates. In other areas the subsoil and underlying material contain more sand and gravel.

Water and air move through this soil at a moderate rate. Surface runoff is rapid. Available water capacity is very high. Organic matter content is low. The surface layer is mainly subsoil material, which puddles and crusts after periods of rainfall. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is poorly suited to cultivated crops. It is moderately suited to pasture and hay. It is well suited to woodland and to habitat for woodland and openland wildlife. It is moderately suited to dwellings and septic tank absorption fields.

Further water erosion is a hazard if this soil is used for corn, soybeans, or small grain. Also, deterioration of tilth is a problem. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to control water erosion. Stripcropping also helps to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Establishing pasture and hay crops helps to control water erosion. Seedbed preparation is difficult in severely eroded areas on side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control further water erosion. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. On sites for dwellings without basements, the shrink-swell potential also is a limitation. Cutting and filling help to overcome the slope. Reinforcing the foundations or extending them below the subsoil helps to prevent the structural damage caused by shrinking and swelling.

The slope is a limitation if this soil is used as a site for septic tank absorption fields. Installing the filter lines on the contour or cutting and filling help to overcome this limitation.

The land capability classification is IVe.

19E3—Sylvan silty clay loam, 15 to 20 percent slopes, severely eroded. This moderately steep, well drained soil is on side slopes in the uplands. Individual areas are long and narrow or irregularly shaped and range from 3 to 140 acres in size.

Typically, the surface layer is mixed brown and yellowish brown, friable silty clay loam about 7 inches thick. The subsoil is about 16 inches thick. It is yellowish brown. The upper part is firm silty clay loam. The lower part is mottled, calcareous, friable silt loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, calcareous, friable silt loam. In some areas the soil has a thicker subsoil and is deeper to carbonates. In other areas the subsoil and underlying material contain more sand and gravel.

Water and air move through this soil at a moderate rate. Surface runoff is rapid. Available water capacity is

very high. Organic matter content is low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is used for pasture and hay. It is moderately suited to pasture and hay and to woodland. It is generally unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the slope.

Establishing pasture and hay crops helps to control water erosion. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing causes surface compaction and excessive runoff and water erosion. Proper stocking rates and timely deferment of grazing help to prevent overgrazing. A no-till method of seeding or pasture renovation helps to control water erosion. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, the hazard of water erosion, the equipment limitation, and seedling mortality are management concerns. Plant competition also is a management concern. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs or trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating competing vegetation from the areas near the seedlings and by selecting the older and larger seedlings for planting. Some replanting may be needed. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is VIe.

24C2—Dodge silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on shoulder slopes and side slopes in the uplands. Individual areas are irregular in shape and range from 3 to 150 acres in size.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. It has been thinned by water erosion. The subsoil is about 32 inches thick. The upper part is yellowish brown, firm silty clay loam and silt loam, and the lower part is brown, firm clay loam and loam. The underlying material to a depth of 60 inches or more is brown, firm, calcareous loam. In some areas the subsoil is thicker. In other areas the upper part of the subsoil has more sand.

Water and air move through this soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops and to dwellings and septic tank absorption fields. It is well suited to pasture and hay.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard. A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, contour farming, and terraces help to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Extending the footings to below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The moderate permeability is a limitation if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome this limitation.

The land capability classification is IIIe.

24D—Dodge silt loam, 10 to 18 percent slopes. This strongly sloping, well drained soil is on shoulder slopes and side slopes in the uplands. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 3 inches thick. The subsurface layer is brown and yellowish brown, friable silt loam

about 9 inches thick. The subsoil is about 20 inches thick. The upper part is yellowish brown, firm silty clay loam. The lower part is brown, very firm clay loam. The underlying material to a depth of 60 inches is yellowish brown, calcareous, very firm loam. In some areas the subsoil is thicker. In other areas the upper part of the subsoil has more sand.

Water and air move through this soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

Most areas are used as woodland. Some areas are used as cropland. This soil is well suited to woodland and to habitat for woodland wildlife. It is poorly suited to cultivated crops. It is moderately suited to pasture and hay and to dwellings and septic tank absorption fields.

Water erosion is a hazard if this soil is used for corn, soybeans, or small grain. Also, deterioration of tilth is a problem. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to control water erosion. Stripcropping also helps to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope and the shrink-swell potential are limitations. Cutting and filling help to overcome the slope. Extending foundation footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The moderate permeability and the slope are limitations if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderate permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IVe.

28—Jules silt loam. This nearly level, well drained soil is on flats and slight rises on flood plains. It is frequently flooded for brief periods from March through June. Individual areas are long and narrow and range from 3 to 600 acres in size.

Typically, the surface layer is mixed dark grayish brown and yellowish brown, calcareous, friable silt loam about 8 inches thick. The underlying material to a depth of 60 inches is stratified dark grayish brown, very dark grayish brown, brown, and yellowish brown, calcareous, friable silt loam. It has thin strata of loam, very fine sandy loam, and loamy sand. In some areas the underlying material has a higher content of sand. In other areas a dark buried soil is within a depth of 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Orion and excessively drained Sarpy soils. Orion soils are more acid than the Jules soil. They are adjacent to upland side slopes. Sarpy soils are droughty. They are in landscape positions similar to those of the Jules soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Jules soil at a moderate rate. Surface runoff is slow. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is low, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard. Dikes or diversions can reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and to wetter conditions also reduces the extent of this damage. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

If this soil is used for pasture, overgrazing causes surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years.

The land capability classification is IIw.

36B—Tama silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on ridgetops in the uplands and on stream terraces. Individual areas are irregular in shape and range from 3 to 750 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 11 inches thick. The subsurface layer is dark brown, friable silt loam about 5 inches thick. The subsoil is about 37 inches thick. It is friable. The upper part is brown silty clay loam. The next part is dark yellowish brown silty clay loam. The lower part is yellowish brown, mottled silty clay loam and silt loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable silt loam. In some areas the surface layer is thinner and lighter in color. In other areas, the subsoil is thinner and carbonates are within a depth of 40 inches.

Included with this soil in mapping are small areas of the poorly drained Denny and Sable and somewhat poorly drained Ipava soils. Denny and Sable soils are subject to ponding and are in depressions and drainageways below the Tama soil. Ipava soils are not subject to water erosion and are on nearly level ridges below the Tama soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Tama soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during spring. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the foundations below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIe.

36C2—Tama silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on ridgetops and side slopes in the uplands. Individual areas are irregular in shape and range from 3 to 120 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. It has been thinned by water erosion. The subsoil is about 40 inches thick. The upper part is brown, friable silty clay loam. The next part is yellowish brown, mottled, firm silty clay loam. The lower part is yellowish brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable silt loam. In some areas the surface layer is lighter in color. In other areas, the subsoil is thinner and carbonates are within a depth of 40 inches. In places the lower part of the subsoil has a higher content of clay and sand.

Water and air move through this soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during spring. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture and hay. It is moderately suited to dwellings and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the

contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIIe.

37B—Worthen silt loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on flats and side slopes on stream terraces. Individual areas are irregular in shape and range from 3 to 290 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer is very dark grayish brown, friable silt loam about 15 inches thick. The subsoil to a depth of more than 60 inches is friable silt loam. The upper part is very dark grayish brown. The next part is brown. The lower part is brown and mottled. In places, the surface layer is thinner and the subsoil contains more sand.

Included with this soil in mapping are small areas of the calcareous, well drained Dorchester and somewhat poorly drained Lawson soils. These soils are subject to flooding and are on flood plains below the Worthen soil. They make up 5 to 10 percent of the unit.

Water and air move through the Worthen soil at a moderate rate. Surface runoff is medium. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential is low, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, to pasture, and to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

The land capability classification is IIe.

43—Ipava silt loam. This nearly level, somewhat poorly drained soil is on broad ridges in the uplands. Individual areas are irregular in shape and range from 3 to 2,000 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 10 inches thick. The subsurface layer also is very dark gray, friable silt loam. It is about 9 inches thick. The subsoil is about 32 inches thick. It is mottled. The upper part is brown, friable silty clay loam. The next part is brown, firm silty clay. The lower part is light olive brown, firm silty clay loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas, the surface layer is thinner and the subsurface layer is lighter in color. In other areas the subsoil contains less clay. In places the slope is more than 2 percent.

Included with this soil in mapping are small areas of the poorly drained Denny and Sable and moderately well drained Tama soils. Denny and Sable soils are subject to ponding and are in depressions and drainageways below the Ipava soil. Tama soils are subject to water erosion and are on ridges and side slopes above the Ipava soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Ipava soil at a moderately slow rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity and organic matter content are high. The shrink-swell potential and the potential for frost action also are high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Subsurface tile drains help to lower the water table. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is I.

45—Denny silt loam. This nearly level, poorly drained soil is in depressions on uplands. It is occasionally ponded for brief periods in spring. Individual areas are round or oblong and range from 3 to 35 acres in size.

Typically, the surface layer is black, very friable silt loam about 9 inches thick. The subsurface layer is dark gray and light brownish gray, very friable silt loam about 12 inches thick. It is mottled in the lower part. The subsoil is light brownish gray, mottled, firm silty clay loam about 26 inches thick. The underlying material to a depth of 60 inches is light gray, mottled, friable silt loam. In some areas, the surface layer is thicker and the subsurface layer is darker. In other areas the surface layer is lighter in color.

Included with this soil in mapping are small areas of the somewhat poorly drained Clarksdale and Keomah soils. These soils are not subject to ponding and are on ridges above the Denny soil. They make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Denny soil at a moderately slow rate and through the lower part at a slow rate. Surface runoff is slow or ponded. The seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is well suited to cultivated crops. It is moderately suited to pasture and hay. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the ponding.

In most areas this soil can be used for corn, soybeans, or small grain because a drainage system has been installed. Measures that maintain or improve the drainage system are needed. Surface drains and surface inlet tile function satisfactorily if suitable outlets are available. Tile drains do not function well because of the slow permeability. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction and crusting, and increase the rate of water intake.

If this soil is used for pasture and hay, the ponding is a hazard. It can be controlled by subsurface drains and surface inlet tile. Canarygrass and alsike clover are suitable forage species. Deferment of grazing when the soil is too wet helps to prevent surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, and applications of fertilizer help to keep the pasture in good condition.

The land capability classification is IIw.

54B—Plainfield loamy sand, 3 to 7 percent slopes. This moderately sloping, excessively drained soil is on low, hummocky dunes on high stream terraces. Individual areas are crescent shaped or irregularly shaped and range from 3 to 500 acres in size.

Typically, the surface layer is dark brown, very friable loamy sand about 9 inches thick. The subsoil is very friable sand about 21 inches thick. The upper part is brown and dark brown, and the lower part is strong brown. The underlying material to a depth of 60 inches is strong brown, loose sand. In some areas short slopes are more than 7 percent. In other areas the surface layer is sandy loam.

Included with this soil in mapping are small areas of the well drained Dickinson and Worthen soils. These soils are not so droughty as the Plainfield soil. They are in the less sloping areas below the Plainfield soil. They make up 5 to 10 percent of the unit.

Water and air move through the Plainfield soil at a rapid rate. Surface runoff is slow. Available water capacity and organic matter content are low. The shrink-swell potential and the potential for frost action also are low.

In most areas this soil is cultivated. It is poorly suited to cultivated crops. It is moderately suited to hay, pasture, and woodland. It is well suited to dwellings but is poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, soil blowing is a hazard and the low available water capacity is a limitation. Field windbreaks and a cover of crop residue help to control soil blowing and minimize the crop damage caused by windblown soil particles. Leaving crop residue on the surface conserves moisture and helps to maintain tilth and fertility.

In areas used as pasture, droughtiness and low fertility are limitations and soil blowing is a hazard. Selection of drought-tolerant grasses and legumes for planting helps to maintain or improve forage stands. Bromegrass, tall fescue, and alfalfa are suitable forage species. Frequently applying small amounts of fertilizer helps to prevent excessive loss of plant nutrients through leaching. Proper stocking rates, rotation grazing, and timely deferment of grazing help to keep the pasture in good condition and help to control soil blowing.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity is a limitation. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IVs.

54D—Plainfield loamy sand, 7 to 18 percent slopes. This strongly sloping, excessively drained soil is on hummocky dunes on high stream terraces. Individual areas are crescent shaped or irregularly shaped and range from 3 to 320 acres in size.

Typically, the surface layer is dark brown, very friable loamy sand about 8 inches thick. The subsoil is brown and strong brown, very friable sand about 23 inches thick. The underlying material to a depth of 60 inches is strong brown, loose sand. In some areas the slope is more than 18 percent. In other areas the surface layer is sandy loam.

Included with this soil in mapping are small areas of the well drained Dickinson and Worthen soils. These soils are less droughty than the Plainfield soil. They are in the less sloping areas below the Plainfield soil. They make up 5 to 10 percent of the unit.

Water and air move through the Plainfield soil at a rapid rate. Surface runoff is slow. Available water capacity and organic matter content are low. The shrink-swell potential and the potential for frost action also are low.

In most areas this soil is cultivated. It generally is unsuited to cultivated crops because of droughtiness and the slope. The cultivated areas should be seeded to pasture or planted to trees. The soil is moderately suited to hay, pasture, and woodland. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

In areas used as pasture, droughtiness and low fertility are limitations and soil blowing is a hazard. Selection of drought-tolerant grasses and legumes for planting helps to maintain or improve forage stands. Bromegrass, tall fescue, and alfalfa are suitable forage species. Frequently applying small amounts of fertilizer helps to prevent excessive loss of plant nutrients through leaching. Proper stocking rates, rotation grazing, and timely deferment of grazing help to keep the pasture in good condition and help to control soil blowing.

If this soil is used as woodland, the hazard of water erosion, the equipment limitation, and seedling mortality are management concerns. Laying out logging roads and skid trails on the contour and seeding bare areas to grass or to a grass-legume mixture help to control water erosion. Skidding the logs or trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that can withstand droughty conditions, by eliminating the competing vegetation near the seedlings, and by selecting the larger and older nursery stock for planting. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting and filling help to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the slope and a poor filtering capacity are limitations. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field. The site should be leveled.

The land capability classification is VIIs.

59—Lisbon silt loam. This nearly level, somewhat poorly drained soil is on slight rises on till plains and on toe slopes on moraines. Individual areas are irregular in shape and range from 3 to 70 acres in size.

Typically, the surface layer is black, friable silt loam about 8 inches thick. The subsurface layer is black, friable silty clay loam about 6 inches thick. The subsoil is mottled, friable silty clay loam about 27 inches thick. The upper part is yellowish brown. The next part is light yellowish brown. The lower part is light brown. The underlying material to a depth of 60 inches or more is brown, mottled, calcareous silt loam. In some areas the subsoil is thicker. In other areas it has a higher content of sand. In some places the underlying material is sandy loam, loamy sand, or sand. In other places the slope is more than 2 percent.

Included with this soil in mapping are small areas of the moderately well drained Catlin, poorly drained Drummer and Sable, and well drained Saybrook soils. Catlin and Saybrook soils are on slight rises above the Lisbon soil. Drummer and Sable soils are in depressions and drainageways below the Lisbon soil. Included soils make up 8 to 15 percent of the unit.

Water and air move through the upper part of the Lisbon soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile

drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Subsurface tile drains help to lower the water table. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is I.

67—Harpster silty clay loam. This nearly level, poorly drained soil is in slight depressions on outwash plains and till plains. It is occasionally ponded for brief periods in spring. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface layer is black, calcareous, friable silty clay loam about 8 inches thick. The subsurface layer is very dark gray, mottled, calcareous, friable silty clay loam about 8 inches thick. The subsoil is mottled, firm, calcareous silty clay loam about 29 inches thick. The upper part is very dark gray. The lower part is gray. The underlying material to a depth of 60 inches or more is gray, mottled, calcareous silt loam. In some areas the surface layer does not have carbonates. In other areas the subsoil contains more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton, Elburn, and Lisbon soils. These soils are on slight rises above the Harpster soil. They make up 1 to 8 percent of the unit.

Water and air move through the Harpster soil at a moderate rate. Surface runoff is slow or ponded. The seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas the soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the ponding.

Because a drainage system has been installed, this soil can be used for corn, soybeans, or small grain. Measures that maintain the drainage system are needed. Subsurface tile drains and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. The high content of lime in this soil decreases the availability of applied phosphorus and potassium fertilizer. Applying the fertilizer at a rate that is higher than normal helps to overcome this limitation. No applications of lime are needed.

The land capability classification is IIw.

68—Sable silty clay loam. This nearly level, poorly drained soil is on broad flats and in depressions and shallow drainageways in the uplands. It is occasionally ponded for brief periods in spring. Individual areas are irregular in shape and range from 3 to 1,500 acres in size.

Typically, the surface layer is black, friable silty clay loam about 8 inches thick. The subsurface layer is black and very dark gray, firm silty clay loam about 14 inches thick. It is mottled in the lower part. The subsoil is mottled, firm silty clay loam about 24 inches thick. The upper part is olive gray. The lower part is light olive gray. The underlying material to a depth of 60 inches is gray, mottled, friable silt loam. In some areas the seasonal high water table is below a depth of 2 feet. In other areas the subsoil contains more clay.

Included with this soil in mapping are small areas of the poorly drained Denny and moderately well drained Tama soils. Denny soils have a light colored subsurface layer, have more clay in the subsoil than the Sable soil, and are less permeable. Also, they are slightly lower on the landscape. Tama soils are subject to water erosion and are on the higher, more sloping parts of the landscape. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Sable soil at a moderate rate. Surface runoff is slow to ponded. The seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during spring. Available water capacity is very high. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the ponding.

If drained, this soil can be used for corn, soybeans, or small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on

the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

The land capability classification is IIw.

74—Radford silt loam. This nearly level, somewhat poorly drained soil is on flats and slight rises on flood plains and in drainageways in the uplands. It is occasionally flooded for brief periods from March through June. Individual areas are long and narrow and range from 3 to 150 acres in size.

Typically, the surface layer is very dark gray, very friable silt loam about 7 inches thick. The subsurface layer is very dark gray, very friable silt loam about 8 inches thick. The underlying material extends to a buried soil at a depth of about 24 inches. It is stratified very dark gray and dark grayish brown, very friable silt loam. The buried soil is very friable silty clay loam. It extends to a depth of more than 60 inches. The upper part is black. The next part is very dark gray and mottled. The lower part is mottled gray, grayish brown, and yellowish brown. In some areas the underlying material is silt loam to a depth of more than 40 inches. In other areas the surface layer is lighter in color.

Included with this soil in mapping are small areas of the well drained Huntsville and poorly drained Sawmill soils. Huntsville soils do not have a buried soil. They are on ridges above the Radford soil. Sawmill soils are frequently flooded and are in low areas below the Radford soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Radford soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops. It is moderately suited to pasture and hay. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard. Also, the seasonal high water table delays planting in some years. Flooding is less frequent than once every 2 years during the growing season. Dikes or diversions reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and to wetter soil conditions also reduces the extent of this damage. Subsurface tile drains function satisfactorily if suitable outlets are available. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

If this soil is used for pasture or hay, the flooding is a hazard and the seasonal high water table is a limitation. Dikes and diversions help to control the flooding, and subsurface tile drains help to lower the water table. Overgrazing causes surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years. Bromegrass, orchardgrass, and alsike clover are suitable forage species.

The land capability classification is IIw.

77—Huntsville silt loam. This nearly level, well drained soil is on slight rises on flood plains near streams. It is occasionally flooded for brief periods from January through June. Individual areas are long and narrow and range from 3 to 100 acres in size.

Typically, the surface layer is very dark brown, friable silt loam about 7 inches thick. The subsurface layer is very dark brown and very dark grayish brown, friable silt loam about 21 inches thick. Below this is a transitional layer of dark brown, friable silt loam about 10 inches thick. The underlying material to a depth of 60 inches is dark yellowish brown, friable silt loam. In some areas the dark subsurface layer is thinner. In other areas the soil has more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Orion and poorly drained Sawmill soils. These soils are in slightly lower positions farther away from the streams. They make up 5 to 10 percent of the unit.

Water and air move through the Huntsville soil at a moderate rate. Surface runoff is slow. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops and woodland. It is moderately suited to pasture and hay. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard. Dikes or diversions can reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and to wetter conditions also reduces the extent of this damage. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

If this soil is used for pasture, overgrazing causes surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep

the pasture in good condition. The flooding delays harvesting of hay in some years.

The land capability classification is IIw.

87B—Dickinson sandy loam, 1 to 4 percent slopes. This gently sloping, well drained soil is on stream terraces and on ridgetops and side slopes on outwash plains. Individual areas are irregular in shape and range from 3 to 400 acres in size.

Typically, the surface layer is very dark grayish brown, friable sandy loam about 9 inches thick. The subsurface layer is very dark grayish brown, friable fine sandy loam about 6 inches thick. The subsoil is about 24 inches thick. It is brown. The upper part is friable fine sandy loam. The next part is very friable loamy sand. The lower part is very friable sand. The underlying material to a depth of 60 inches is brown, loose sand. In some areas the upper part of the subsoil contains more sand. In other areas the subsoil contains more clay. In places the surface layer and subsurface layer are thinner. In areas where slopes are concave, the surface layer and subsurface layer are thicker.

Included with this soil in mapping are small areas of the excessively drained Plainfield soils. These soils have a lower available water capacity than the Dickinson soil and are in the higher landscape positions. They make up less than 10 percent of the unit.

Water and air move through the upper part of the Dickinson soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is medium. Available water capacity is low. Organic matter content is moderately low. The shrink-swell potential is low, and the potential for frost action is moderate.

In most areas this soil is used for cultivated crops or hay. It is moderately suited to cultivated crops, hay, and pasture. It is well suited to dwellings but is poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, water erosion and soil blowing are hazards. Also, the low available water capacity and the level of fertility are limitations. Applying a system of conservation tillage that leaves crop residue on the surface after planting and regularly adding other organic material help to control water erosion and soil blowing, conserve moisture, and improve fertility.

In areas used as pasture, droughtiness and low fertility are limitations and soil blowing is a hazard. Selection of drought-tolerant grasses and legumes for planting helps to maintain or improve forage stands. Bromegrass, tall fescue, and alfalfa are suitable forage species. Frequently applying small amounts of fertilizer helps to prevent excessive loss of plant nutrients through leaching. Proper stocking rates, rotation grazing, and timely deferment of grazing help to keep the pasture in good condition and help to control soil blowing.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity is a limitation. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. Filling or mounding with suitable material increases the filtering capacity of the field.

The land capability classification is IIe.

92A—Sarpy loamy sand, 0 to 3 percent slopes. This nearly level, excessively drained soil is on slight rises on flood plains. It is frequently flooded for long periods from November through June. Individual areas are long and narrow or irregularly shaped and range from 3 to 240 acres in size.

Typically, the surface layer is very dark grayish brown, calcareous, very friable loamy sand about 4 inches thick. The underlying material to a depth of 60 inches is brown, calcareous, loose sand. In some places the soil has less sand and more silt throughout. In other places the surface layer is silt loam overwash.

Included with this soil in mapping are small areas of the poorly drained Titus soils. These soils formed in silty and clayey alluvium and are higher in content of clay than the Sarpy soil. They are in the lower positions on the landscape. Included areas make up 2 to 15 percent of the unit.

Water and air move through the Sarpy soil at a rapid or very rapid rate. Surface runoff is very slow. Available water capacity and organic matter content are low. The shrink-swell potential and the potential for frost action also are low.

Most areas are used as woodland. Some areas are used as pasture. This soil is poorly suited to cultivated crops, pasture, and hay. It is moderately suited to woodland. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn or soybeans, flooding is a severe hazard and the low available water capacity is a limitation. Flooding is likely to occur more often than once every 2 years for long periods during the growing season. Levees, dikes, or diversions help to reduce the extent of crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and to wetter conditions also reduces the extent of this damage. Leaving crop residue on the surface conserves moisture and helps to maintain tilth and fertility.

If this soil is used for pasture and hay, the flooding is a hazard and the low available water capacity is a limitation. Rotation grazing, timely deferment of grazing,

and applications of fertilizer help to keep the pasture in good condition. Bromegrass and tall fescue are suitable forage species. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, seedling mortality is a management concern. It is caused by the low available water capacity. The seedling mortality rate can be reduced by planting nursery stock that is larger than is typical, by planting in furrows, and by mulching. Competing vegetation can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is IVs.

104—Virgil silt loam. This nearly level, somewhat poorly drained soil is on flats on outwash plains. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is grayish brown, mottled, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper part is brown, friable silty clay loam. The next part is light brownish gray, firm silty clay loam. The lower part is light brownish gray, friable silty clay loam and clay loam. In some areas the subsurface layer is darker.

Included with this soil in mapping are small areas of the well drained St. Charles soils. These soils are on ridges and side slopes above the Virgil soil. They make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Virgil soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, hay, and woodland. It is poorly suited to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundations helps to overcome this limitation.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderate permeability are limitations. Subsurface tile drains help to lower the water table. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderate permeability.

The land capability classification is I.

107—Sawmill silty clay loam. This nearly level, poorly drained soil is on broad flats on flood plains and in small drainageways in the uplands. It is frequently flooded for brief periods from March through June. Individual areas are long and narrow and range from 2 to 400 acres in size.

Typically, the surface layer is black, friable silty clay loam about 8 inches thick. The subsurface layer is firm silty clay loam about 25 inches thick. The upper part is black. The lower part is very dark gray and mottled. The subsoil to a depth of 60 inches is mottled, firm silty clay loam. The upper part is dark grayish brown. The lower part is grayish brown and has strata of silt loam. In some areas the surface layer has more sand.

Included with this soil in mapping are small areas of the well drained Huntsville and Worthen soils. These soils are not frequently flooded and are on slight rises and terraces above the Sawmill soil. They make up 10 to 15 percent of the unit.

Water and air move through the Sawmill soil at a moderate rate. Surface runoff is slow. The seasonal high water table is within 2 feet of the surface in the spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops, pasture, and hay. It is well suited to woodland. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn or soybeans, the flooding is a hazard and the wetness is a limitation. Flooding is likely to occur more often than once every 2 years during the growing season. Dikes or diversions can reduce the extent of crop damage caused by floodwater. In most areas the soil can be used for corn or soybeans because a drainage system has been installed. Measures that maintain or improve the drainage system are needed. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting improves tilth, minimizes

surface compaction and crusting, and increases the rate of water intake.

If this soil is used as woodland, the equipment limitation, seedling mortality, and windthrow are management concerns. They are caused by the wetness. Plant competition also is a management concern. It hinders the growth of desirable seedlings. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting on ridges, by selecting nursery stock that is older and larger than is typical, or by mulching. Some replanting may be needed. Removing high-value trees only from a strip 50 feet wide along the west and south edges of the woodland and using harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Plant competition can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The grain and seed crops, grasses and legumes, and wild herbaceous plants used as food and cover by openland wildlife grow well on this soil. Measures that protect the habitat from fire and grazing are needed. Some low areas in old oxbows and depressions are wet. Wetland plants and shallow water areas, which enhance wetland wildlife habitat, can be easily established in the oxbows and depressions.

The land capability classification is IIIw.

119D2—Elco silt loam, 8 to 15 percent slopes, eroded. This strongly sloping, moderately well drained soil is on shoulder slopes and side slopes in the uplands. Individual areas are long and narrow and range from 3 to 100 acres in size.

Typically, the surface layer is mixed dark grayish brown and dark yellowish brown, friable silt loam about 4 inches thick. The subsurface layer is dark brown and dark yellowish brown, friable silt loam about 4 inches thick. The subsoil extends to a depth of more than 60 inches. In sequence downward, it is dark yellowish brown, friable silt loam; yellowish brown, firm silty clay loam; brown, mottled, firm silty clay loam; grayish brown, mottled, firm silty clay loam; and gray, mottled, firm silty clay loam. In some areas the surface layer is darker and thicker. In other areas the upper part of the subsoil is clay loam. In places the surface layer is silty clay loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Lawson soils. These soils are subject to flooding and are in the drainageways below the Elco soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow or slow rate. Surface runoff is rapid. The seasonal high water table is 2.5 feet to 4.5 feet below the surface during spring. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is well suited to woodland. It is moderately suited to cultivated crops, pasture, and hay and to dwellings without basements. It is poorly suited to dwellings with basements and to septic tank absorption fields.

Further water erosion is a hazard if this soil is used for corn, soybeans, or small grain. Also, deterioration of tilth is a problem. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to control water erosion. Stripcropping also helps to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings with basements, the seasonal high water table, the slope, and the shrink-swell potential are limitations. The shrink-swell potential and the slope are limitations on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Cutting and filling help to overcome the slope. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table, the moderately slow or slow permeability, and the slope are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IIIe.

119E—Elco silt loam, 15 to 20 percent slopes. This moderately steep, moderately well drained soil is on shoulder slopes and side slopes in the uplands. Individual areas are long and narrow and range from 3 to 650 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is brown, friable silt loam about 3 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable silt loam and silty clay loam. The next part is yellowish brown, mottled, firm silty clay loam. The lower part is brown and grayish brown, mottled, firm silty clay loam. In some areas the surface layer is thicker. In other areas the upper part of the subsoil is clay loam. In places the slope is more than 20 percent.

Included with this soil in mapping are small areas of the somewhat poorly drained Lawson soils. These soils are subject to flooding and are in drainageways below the Elco soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow or slow rate. Surface runoff is rapid. The seasonal high water table is 2.5 feet to 4.5 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is used as pasture. It is well suited to woodland. It is moderately suited to pasture and hay. It is poorly suited to cultivated crops. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the slope.

Establishing pasture and hay crops helps to control water erosion. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing causes surface compaction and excessive runoff and water erosion. Proper stocking rates and timely deferment of grazing help to prevent overgrazing. A no-till method of seeding or pasture renovation helps to control water erosion. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, the hazard of water erosion and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs and trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is IVe.

131D2—Alvin fine sandy loam, 7 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on side slopes on terraces and in the uplands. Individual areas are long and narrow and range from 3 to 135 acres in size.

Typically, the surface layer is mixed brown and dark yellowish brown, very friable fine sandy loam about 7 inches thick. It has been thinned by water erosion. The subsurface layer is mixed light brown and strong brown, very friable fine sandy loam about 7 inches thick. The subsoil is about 33 inches thick. The upper part is brown, friable fine sandy loam. The next part is strong brown, friable loam. The lower part is strong brown, very friable fine sandy loam. The underlying material to a depth of 60 inches is brown and dark yellowish brown, stratified, loose loamy fine sand and fine sand. In some areas the underlying material contains less sand and more silt. In other areas the subsoil is thinner and contains more sand. In places the underlying material is loamy glacial till.

Included with this soil in mapping are small areas of the moderately well drained Elco soils. These soils have more clay and less sand throughout than the Alvin soil and are less permeable. They are in positions in the uplands similar to those of the Alvin soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Alvin soil at a moderate or moderately rapid rate and through the lower part at a moderately rapid rate. Surface runoff is medium. Available water capacity is moderate. Organic matter content is low. The shrink-swell potential also is low, and the potential for frost action is moderate.

In most areas this soil is used as pasture. It is well

suited to woodland. It is moderately suited to cultivated crops, pasture, and hay and to dwellings and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, water erosion and soil blowing are hazards. Also, the moderate available water capacity and the level of fertility are limitations. Water erosion can be controlled and moisture conserved by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Field windbreaks and a tillage system that leaves the surface rough help to control soil blowing. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent excessive water erosion and soil blowing. The plants should not be grazed or clipped until they are sufficiently established. Planting on the contour helps to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings or septic tank absorption fields, the slope is a limitation. Cutting and filling help to overcome this limitation on sites for dwellings. Installing the filter lines on the contour helps to overcome the slope on sites for septic tank absorption fields.

The land capability classification is IIIe.

132—Starks silt loam. This nearly level, somewhat poorly drained soil is on stream terraces and on low ridges in the uplands. Individual areas are irregular in shape and range from 3 to 35 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is brown, mottled, friable silt loam about 4 inches thick. The subsoil is about 31 inches thick. It is mottled. The upper part is brown and light brownish gray, firm silty clay loam. The lower part is grayish brown and light brownish gray, firm clay loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, stratified loam, clay loam, and sandy loam. In places the surface layer is thicker and darker.

Included with this soil in mapping are small areas of the well drained Camden soils. These soils are subject to water erosion and are on side slopes above the Starks soil. They make up 2 to 10 percent of the unit.

Water and air move through the Starks soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, hay, and woodland. It is poorly suited to dwellings and septic tank absorption fields.

Most areas of this soil can be used for corn, soybeans, or small grain because a drainage system has been installed. Measures that maintain the drainage system are needed. Subsurface tile drains are suitable if outlets are available. Keeping tillage to a minimum and leaving crop residue on the surface after planting help to maintain tilth and minimize crusting.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, reed canarygrass, and red clover are suitable forage species. Subsurface tile drains can help to lower the seasonal high water table if suitable outlets are available. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundations helps to overcome this limitation.

The seasonal high water table and the moderate permeability are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderate permeability.

The land capability classification is IIw.

134B—Camden silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on stream terraces and on slight rises on outwash plains. Individual areas are irregular in shape and range from 3 to 160 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsoil is about 35 inches thick. The upper part is brown, friable silty clay loam. The next part is yellowish brown, firm silty clay loam. The lower part is yellowish brown, friable sandy clay loam. The underlying material to a depth of 60 inches is stratified brown and yellowish brown, mottled, friable sandy loam, loamy sand, and loam. In some areas the surface layer is darker. In other areas the seasonal high water table is within a depth of 60 inches.

Included with this soil in mapping are small areas of the poorly drained Drummer soils. These soils have a silty layer that is thicker than that of the Camden soil. They are on nearly level ridges or in shallow depressions below the Camden soil. They make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Camden soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, hay, and woodland. It is moderately suited to dwellings and well suited to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings without basements, the shrink-swell potential is a limitation. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

134C2—Camden silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on stream terraces and on the sides of ridges on outwash plains. Individual areas are irregular in shape and range from 3 to 40 acres in size.

Typically, the surface layer is brown, friable silt loam about 6 inches thick. It has been thinned by water erosion. The subsoil is about 41 inches thick. The upper part is yellowish brown, friable and firm silty clay loam. The next part is dark yellowish brown, very firm clay loam. The lower part is yellowish brown, friable fine sandy loam. The underlying material to a depth of 60 inches is dark yellowish brown, very friable and loose, stratified fine sandy loam, loamy fine sand, and fine sand. In some areas the surface layer is silty clay loam. In other areas the lower part of the subsoil and the underlying material have less than 15 percent sand. In places the surface layer is thicker or darker.

Included with this soil in mapping are small areas of the somewhat poorly drained Virgil soils. These soils are not subject to water erosion and are in the less sloping areas below the Camden soil. They make up 2 to 8 percent of the unit.

Water and air move through the upper part of the Camden soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops and to dwellings. It is well suited to septic tank absorption fields and to pasture, hay, and woodland.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIIe.

134D2—Camden silt loam, 10 to 18 percent slopes, eroded. This strongly sloping, well drained soil is on stream terraces and on the sides of ridges on outwash plains. Individual areas are long and narrow and range from 3 to 35 acres in size.

Typically, the surface layer is mixed dark grayish brown and yellowish brown, friable silt loam about 6 inches thick. It has been thinned by water erosion. The subsoil is about 32 inches thick. It is yellowish brown and friable. The upper part is silty clay loam. The lower part is stratified sandy loam and coarse sandy loam. The underlying material to a depth of 60 inches is yellowish brown, stratified silt loam and loam. In some areas the lower part of the subsoil and the underlying material have less than 15 percent sand.

Included with this soil in mapping are small areas of Alvin soils. These soils have an available water capacity that is lower than that of the Camden soil. They are in landscape positions similar to those of the Camden soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Camden soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is rapid in cultivated areas. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture, hay, and woodland. It is moderately suited to dwellings and septic tank absorption fields.

Further water erosion is a hazard if this soil is used for corn, soybeans, or small grain. Also, deterioration of tilth is a problem. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to control water erosion. Stripcropping also helps to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. On sites for dwellings without basements, the shrink-swell potential also is a limitation. Cutting and filling help to overcome the slope. Reinforcing the foundations or extending them below the subsoil helps to prevent the structural damage caused by shrinking and swelling.

The slope is a limitation if this soil is used as a site for septic tank absorption fields. Installing the filter lines on the contour or cutting and filling help to overcome this limitation.

The land capability classification is IIIe.

145B2—Saybrook silt loam, 2 to 5 percent slopes, eroded. This gently sloping, well drained soil is on ridgetops and side slopes on till plains. Individual areas are irregular in shape and range from 3 to 150 acres in size.

Typically, the surface layer is mixed very dark grayish brown and brown, friable silt loam about 8 inches thick. It has been thinned by water erosion. The subsoil is about 32 inches thick. The upper part is

yellowish brown, friable and firm silty clay loam. The next part is brown, firm clay loam. The lower part is brown, firm loam. The underlying material to a depth of 60 inches is brown, calcareous loam. In some areas the subsoil contains more sand. In other areas the soil is deeper to calcareous material. In places the surface layer is thicker.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Lisbon and Elburn soils. These soils are in shallow depressions and drainageways below the Saybrook soil. They make up 5 to 15 percent of unit.

Water and air move through the Saybrook soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, hay, and pasture and to dwellings. It is moderately suited to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

The moderate permeability is a limitation if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome this limitation.

The land capability classification is IIe.

145C2—Saybrook silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes on moraines and till plains. Individual areas are irregular in shape and range from 2 to 30 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. It has been thinned by water erosion. The subsoil is about 24 inches thick. The upper part is dark yellowish brown and yellowish brown, firm silty clay loam. The lower part is brown, firm loam. The underlying material to a depth of 60 inches or more is calcareous, firm loam. In some places the subsoil has more sand. In other places the surface layer is lighter in color. In some areas the soil is deeper to calcareous material.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Elburn and Lisbon soils. These soils are in drainageways and low areas below the Saybrook soil. They make up 5 to 15 percent of the unit.

Water and air move through the Saybrook soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture and hay and to dwellings. It is moderately suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

The moderate permeability is a limitation if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome this limitation.

The land capability classification is IIIe.

148B—Proctor silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on ridgetops and side slopes in the uplands and on stream terraces. Individual areas are irregular in shape and range from 3 to 70 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 3 inches thick. The subsoil is about 35 inches thick. The upper part is dark yellowish brown and yellowish brown, friable silty clay loam. The next part is yellowish brown, friable loam. The lower part is strong brown, stratified, very friable loam and sandy loam. The underlying material to a depth of 60 inches is strong brown, stratified, very friable sandy loam and loamy sand. In some areas the surface soil is thinner and lighter in color. In other areas the silty material is thicker.

Included with this soil in mapping are small areas of

the poorly drained Drummer and somewhat poorly drained Brenton and Elburn soils. Drummer soils are in slight depressions or in narrow drainageways. Brenton and Elburn soils are in nearly level areas below the Proctor soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Proctor soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings. It is well suited to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

148C2—Proctor silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes on outwash plains and on stream terraces. Individual areas are irregular in shape and range from 3 to 70 acres in size.

Typically, the surface layer is mixed very dark grayish brown and dark yellowish brown, friable silty clay loam about 7 inches thick. It has been thinned by water erosion. The subsoil is about 34 inches thick. The upper part is dark yellowish brown, friable silty clay loam. The lower part is dark yellowish brown and yellowish brown, stratified, friable loam, sandy loam, and loamy sand. The underlying material to a depth of 60 inches is dark yellowish brown and yellowish brown, stratified, very friable loam, sandy loam, and loamy sand. In some areas the lower part of the subsoil has less sand. In other areas the subsoil is underlain by loose sand. In places the surface layer is lighter in color.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Brenton and Elburn soils. Drummer soils are in slight depressions or narrow drainageways below the Proctor soil. Brenton and Elburn soils are in nearly level areas below the Proctor soil. Included soils make up less than 15 percent of the unit.

Water and air move through the upper part of the Proctor soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture and hay and to septic tank absorption fields. It is moderately suited to dwellings.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIIe.

149—Brenton silt loam. This nearly level, somewhat poorly drained soil is on slight rises on broad outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 50 acres in size.

Typically, the surface layer is black, friable silt loam about 11 inches thick. The subsurface layer is very dark gray, friable silt loam about 5 inches thick. The subsoil is about 36 inches thick. It is mottled and friable. The upper part is dark brown silt loam. The next part is brown silty clay loam. The lower part is yellowish brown and brownish yellow, stratified silt loam, loam, and silty clay loam. The underlying material to a depth of 60 inches is brownish yellow and yellow, mottled, stratified, friable silt loam and loam. In some areas the surface

layer is thinner and lighter in color.

Included with this soil in mapping are small areas of the poorly drained Drummer and well drained Proctor soils. Drummer soils are in shallow depressions and drainageways below the Brenton soil. Proctor soils are on side slopes above the Brenton soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Brenton soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundations helps to overcome this limitation.

The seasonal high water table and the moderate permeability are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderate permeability.

The land capability classification is I.

152—Drummer silty clay loam. This nearly level, poorly drained soil is on broad flats and in depressions and shallow drainageways on outwash plains. It is occasionally ponded for brief periods in spring. Individual areas are irregular in shape and range from 3 to 500 acres in size.

Typically, the surface layer is black, friable silty clay loam about 7 inches thick. The subsurface layer is friable silty clay loam about 15 inches thick. It is black in the upper part and very dark gray and mottled in the lower part. The subsoil is about 32 inches thick. It is mottled. The upper part is light yellowish brown, dark gray, and grayish brown, friable silty clay loam. The lower part is dark grayish brown, stratified, friable loam and sandy loam. The underlying material to a depth of 60 inches is grayish brown, mottled, stratified, friable sandy loam and loamy sand. In some areas, the surface soil is thicker or the subsoil has more clay, or both. In other areas carbonates are within a depth of 35 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton, Elburn, and Lisbon and moderately well drained Catlin soils. These soils are on knobs and rises above the Drummer soil. Also included, in depressions, are soils that are ponded during the growing season in most years. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Drummer soil at a moderate rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above the surface to 2.0 feet below during spring. Available water capacity is very high. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is generally unsuitable as a site for dwellings and septic tank absorption fields because of the ponding.

If drained, this soil can be used for corn, soybeans, or small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

The land capability classification is IIw.

171B2—Catlin silt loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on side slopes on till plains. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. It has been thinned by water erosion. The subsoil is about 41 inches thick. The upper part is brown, friable silty clay loam. The next part is dark yellowish brown, mottled, friable silty clay loam and silt loam. The lower part is brown, firm, calcareous loam. The underlying material to a depth of 60 inches is brown, calcareous, firm loam. In some areas the surface layer is lighter in color. In other areas the underlying material is noncalcareous, stratified outwash. In some places, the subsoil is thinner and glacial till is within a depth of 40 inches. In other places the glacial till is below a depth of 60 inches.

Included with this soil in mapping are small areas of the poorly drained Sable and somewhat poorly drained Ipava and Elburn soils. These soils are in drainageways

and the less sloping areas below the Catlin soil. They make up 5 to 15 percent of the unit.

Water and air move through the Catlin soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 3.5 to 6.0 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIe.

171C2—Catlin silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on side slopes on till plains. Individual areas are irregular in shape and range from 3 to 50 acres in size.

Typically, the surface layer is mixed very dark grayish brown and brown, friable silt loam about 8 inches thick. It has been thinned by water erosion. The subsoil is about 45 inches thick. The upper part is brown and dark yellowish brown, friable and firm silty clay loam. The next part is yellowish brown, mottled, firm silt loam. The lower part is yellowish brown, mottled, friable loam. The underlying material to a depth of 60 inches or more is brown, calcareous, firm loam. In some areas the surface layer is lighter in color. In other areas the underlying material is noncalcareous, stratified outwash. In some places, the subsoil is thinner and glacial till is within a depth of 40 inches. In other places the glacial till is below a depth of 60 inches.

Included with this soil in mapping are small areas of the poorly drained Sable and somewhat poorly drained Ipava and Elburn soils. These soils are in drainageways and on slopes below the Catlin soil. They make up 10 to 15 percent of the unit.

Water and air move through the Catlin soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 3.5 to 6.0 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops and to dwellings and septic tank absorption fields. It is well suited to hay and pasture.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIIe.

198—Elburn silt loam. This nearly level, somewhat poorly drained soil is on slight rises on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The

subsurface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper part is brown, friable silty clay loam. The next part is grayish brown, firm and friable silty clay loam. The lower part is light brownish gray, friable loam. In some areas the surface layer is lighter in color. In other areas the lower part of the subsoil formed in calcareous loam glacial till. In places the upper part of the subsoil contains more sand.

Included with this soil in mapping are small areas of the poorly drained Drummer and well drained Plano soils. Plano soils are on slight rises above the Elburn soil. Drummer soils are in drainageways and depressions below the Elburn soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the upper part of the Elburn soil at a moderate rate and through the lower part at a moderate or moderately rapid rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundations helps to overcome this limitation.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table. Grading and land shaping help to remove excess surface water.

The land capability classification is I.

199B—Plano silt loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on ridges and short, uneven side slopes on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 160 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 11 inches thick. The subsoil is about 42 inches thick. It is friable. The upper part is brown and dark yellowish brown silty clay loam. The next part is dark yellowish brown, mottled silty clay loam. The lower part is yellowish brown, mottled, stratified sandy loam and loam. The underlying material to a depth of 60 inches is brown, mottled, stratified, friable loamy sand and sandy loam. In some areas the surface soil is thinner and lighter in color. In other areas the silty material extends to a depth of more than 60 inches. In places the upper part of the subsoil contains more sand.

Included with this soil in mapping are small areas of the poorly drained Drummer and somewhat poorly drained Elburn soils. These soils are in shallow depressions and drainageways below the Plano soil. They make up 5 to 15 percent of the unit.

Water and air move through the Plano soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay and to septic tank absorption fields. It is moderately suited to dwellings.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

210—Lena muck. This nearly level, very poorly drained soil is in a slightly depressional bog on a flood plain. It is subject to ponding for long periods from November through June. It is frequently flooded for long periods from March through June. Only one area of this soil is mapped in Peoria County. It is oblong and is about 50 acres in size.

Typically, the surface layer is very dark gray, mottled, calcareous, friable muck about 5 inches thick. Below this to a depth of 60 inches are layers of very dark gray, mottled, calcareous, friable muck. In some areas the surface layer has a higher content of silt and clay.

Water and air move through this soil at a moderately rapid rate. Surface runoff is very slow. The seasonal high water table is 1 foot above the surface to 1 foot below during winter and spring. Available water capacity is very high. Organic matter content also is very high. The potential for frost action is high.

Most of the acreage is idle land that supports marsh

vegetation. Some areas are occasionally used for cultivated crops. This soil is well suited to habitat for wetland wildlife. It generally is unsuited to cultivated crops, hay, and pasture and to dwellings and septic tank absorption fields because of the flooding and ponding.

The plant species that grow naturally on this soil furnish food and cover for wetland wildlife. Open water areas can be easily developed. Measures that protect the habitat from fire and grazing are needed.

The land capability classification is Vw.

224D3—Strawn silty clay loam, 8 to 15 percent slopes, severely eroded. This strongly sloping, well drained soil is on side slopes on dissected till plains in the uplands. In most areas, nearly all of the original surface layer has been removed by water erosion and tillage has mixed the rest with the upper part of the subsoil. Individual areas are long and narrow or irregularly shaped and range from 3 to 120 acres in size.

Typically, the surface layer is dark yellowish brown, friable silty clay loam about 4 inches thick. The subsoil is about 16 inches thick. The upper part is brown, friable clay loam. The lower part is brown, calcareous, firm loam. The underlying material to a depth of 60 inches also is brown, calcareous, firm loam. In some areas the subsoil is thicker. In other areas the soil has less than 10 percent sand throughout. In places the seasonal high water table is within a depth of 60 inches.

Included with this soil in mapping are small areas of Hennepin soils and the moderately well drained Marseilles soils. Hennepin soils do not have an accumulation of clay in the subsoil. They are on the steeper slopes. Marseilles soils are moderately deep over shale bedrock. They are on the lower parts of the slopes. Included soils make up less than 10 percent of the unit.

Water and air move through the upper part of the Strawn soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid. Available water capacity is moderate. Organic matter content is low. The surface layer puddles and crusts easily after periods of rainfall. The shrink-swell potential and the potential for frost action are moderate.

In most areas this soil is cultivated. It is poorly suited to cultivated crops. It is moderately suited to pasture and hay. It is well suited to woodland. It is moderately suited to dwellings and septic tank absorption fields.

Further water erosion is a severe hazard if this soil is used for corn, soybeans, or small grain. Also, deterioration of tilth is a problem. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to control water erosion. Stripcropping also helps to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Establishing pasture and hay crops helps to control water erosion. Seedbed preparation is difficult in severely eroded areas on side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps to control water erosion. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. The plants should not be grazed until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope is a limitation. Cutting and filling help to overcome this limitation.

The moderately slow permeability and the slope are limitations if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderately slow permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IVe.

224E—Strawn silt loam, 15 to 30 percent slopes. This steep, well drained soil is on side slopes on till plains in the uplands. Individual areas are long and narrow or irregularly shaped and range from 3 to 400 acres in size.

Typically, the surface layer is very dark grayish brown, very friable silt loam about 5 inches thick. The subsoil is friable silty clay loam about 19 inches thick. The upper part is brown and dark brown. The lower part is brown and calcareous. The underlying material to a depth of 60 inches or more is brown, calcareous, friable loam. In some areas the subsoil is thicker. In other areas the soil has less than 10 percent sand throughout.

Included with this soil in mapping are small areas of

the well drained Dorchester, moderately well drained Marseilles, and somewhat poorly drained Radford soils. Dorchester and Radford soils are in narrow drainageways below the Strawn soil. Marseilles soils are moderately deep over shale. They are on the lower parts of the slopes. Included soils make up less than 10 percent of the unit.

Water and air move through the upper part of the Strawn soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid. Available water capacity is moderate. Organic matter content is low. The shrink-swell potential and the potential for frost action are moderate.

In most areas this soil is used as pasture or woodland. It is well suited to woodland. It is moderately suited to pasture and hay. It generally is unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the slope.

Establishing pasture and hay crops helps to control water erosion. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing causes surface compaction, excessive runoff, and a greater susceptibility to water erosion. Proper stocking rates and timely deferment of grazing help to prevent overgrazing. A no-till method of seeding or pasture renovation helps to control water erosion. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, the hazard of water erosion, the equipment limitation, and seedling mortality are management concerns. Plant competition also is a management concern. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs or trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating competing vegetation from the areas near the seedlings and by selecting the older and larger seedlings for planting. Some replanting may be needed. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is VIe.

239—Dorchester silt loam. This nearly level, well drained soil is on slight rises on flood plains and in drainageways in the uplands. It is frequently flooded for very brief periods from February through November. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is dark grayish brown, calcareous, friable silt loam about 9 inches thick. The underlying material extends to a buried soil at a depth of about 32 inches. It is stratified dark grayish brown, brown, very dark gray, and very dark grayish brown, calcareous, friable silt loam that has thin strata of loam. The buried soil to a depth of 60 inches is black and very dark gray, friable silt loam. It is mottled in the lower part. In some areas the surface layer is thicker and is not calcareous. In other areas the buried soil is below a depth of 45 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Lawson and poorly drained Sawmill soils. These soils are flooded for longer periods than the Dorchester soil. Also, Sawmill soils contain more clay. They are in low areas below the Dorchester soil. Lawson soils are in landscape positions similar to those of the Dorchester soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Dorchester soil at a moderate rate. Surface runoff is slow. Available water capacity is very high. Organic matter content is low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops. It is moderately suited to pasture, hay, and woodland. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard. Dikes or diversions can reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and to wetter conditions also reduces the extent of this damage. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

If this soil is used for pasture, overgrazing causes surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the

woodland from fire are needed.

The land capability classification is IIw.

243B—St. Charles silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on ridgetops and slight rises on outwash plains and on stream terraces. Individual areas are irregular in shape and range from 3 to 60 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is brown, friable silt loam about 5 inches thick. The subsoil to a depth of 60 inches is brown and yellowish brown, friable and firm silty clay loam and clay loam. In some areas, the subsoil is thinner and the loamy outwash is within a depth of 40 inches. In other areas the loamy outwash is below a depth of 60 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Virgil soils. These soils are in shallow depressions below the St. Charles soil. They make up 5 to 10 percent of the unit.

Water and air move through the St. Charles soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, hay, and woodland and to septic tank absorption fields. It is moderately suited to dwellings.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the moderate permeability is a limitation. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderate permeability.

The land capability classification is IIe.

243C2—St. Charles silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes in the uplands and on short side slopes on stream terraces. Individual areas are irregular in shape and range from 3 to 20 acres in size.

Typically, the surface layer is mixed dark brown and yellowish brown, friable silt loam about 5 inches thick. It has been thinned by water erosion. The subsoil to a depth of more than 60 inches is yellowish brown, friable and firm silt loam, silty clay loam, and loam. In some areas gravel is in the lower part of the subsoil. In other areas the upper part of the subsoil has more sand. In places the lower part of the subsoil has less sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Keomah and Virgil soils. These soils are in shallow depressions below the St. Charles soil. They make up 5 to 10 percent of the unit.

Water and air move through the St. Charles soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is used for cultivated crops or for pasture and hay. It is moderately suited to cultivated crops, hay, pasture, and woodland and to dwellings. It is well suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of

fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the moderate permeability is a limitation. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderate permeability.

The land capability classification is IIIe.

257—Clarksdale silt loam. This nearly level, somewhat poorly drained soil is dominantly on broad ridgetops in the uplands. In a few areas it is on stream terraces. Individual areas are irregular in shape and range from 3 to 550 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled and friable. The upper part is brown silty clay loam. The next part is dark grayish brown silty clay loam. The lower part is light brownish gray silt loam. In some areas the surface layer and subsurface layer are darker. In other areas the surface layer is lighter in color.

Included with this soil in mapping are small areas of the poorly drained Denny and moderately well drained Downs soils. Denny soils are subject to ponding and are in slight depressions below the Clarksdale soil. Downs soils are subject to water erosion and are on side slopes above the Clarksdale soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Clarksdale soil at a moderately slow rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, hay, and woodland. It is poorly suited to dwellings and septic tank absorption fields.

No major limitations affect the use of this soil for corn, soybeans, or small grain. The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, reed canarygrass, and red clover are suitable forage species. Subsurface tile drains can help to lower the seasonal high water table if suitable outlets are available. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing subsurface tile drains near the foundations helps overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow permeability are limitations. Subsurface tile drains help to lower the water table. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderately slow permeability.

The land capability classification is I.

259C2—Assumption silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on shoulder slopes and side slopes in the uplands. Individual areas are long and narrow and range from 3 to 100 acres in size.

Typically, the surface layer is mixed very dark grayish brown and brown, friable silt loam about 9 inches thick. It has been thinned by water erosion. The subsoil extends to a depth of more than 60 inches. In sequence downward, it is brown, friable silty clay loam;

brown, mottled, friable silty clay loam; grayish brown, mottled, firm silty clay loam; and grayish brown, mottled, firm clay loam. In some areas the surface layer is lighter in color. In other areas, the lower part of the subsoil contains less sand and carbonates are within a depth of 40 inches.

Water and air move through the upper part of this soil at a moderate rate and through the lower part at a moderately slow or slow rate. Surface runoff is medium. The seasonal high water table is 2.5 to 4.5 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture and hay. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the moderately slow or slow permeability are limitations. Subsurface tile drains help to lower the water table. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderately slow or slow permeability.

The land capability classification is IIIe.

259D2—Assumption silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, moderately well drained soil is on shoulder slopes and side slopes in the uplands. Individual areas are long and narrow and range from 5 to 100 acres in size.

Typically, the surface layer is mixed dark brown and yellowish brown, friable silt loam about 9 inches thick. It has been thinned by water erosion. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown and brown, friable silt loam. The lower part is brown and grayish brown, mottled, firm silty clay loam. In some areas the surface layer is lighter in color. In other areas, the subsoil contains less sand and carbonates are within a depth of 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Radford soils. These soils formed in alluvium and are subject to flooding. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Assumption soil at a moderate rate and through the lower part at a moderately slow or slow rate. Surface runoff is rapid. The seasonal high water table is 2.5 to 4.5 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture and hay. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

Further water erosion is a hazard if this soil is used for corn, soybeans, or small grain. Also, deterioration of tilth is a problem. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to control water erosion. Stripcropping also helps to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings with basements, the seasonal high water table, the slope, and the shrink-swell potential are limitations. The shrink-swell potential and the slope are limitations on

sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Cutting and filling help to overcome the slope. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table, the moderately slow or slow permeability, and the slope are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderately slow or slow permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IIIe.

279B—Rozetta silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is dominantly on broad ridgetops and side slopes in the uplands. In a few areas it is on stream terraces near the major drainageways. Individual areas are irregular in shape and range from 3 to 700 acres in size.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsurface layer is yellowish brown, friable silt loam about 5 inches thick. The subsoil is about 46 inches thick. The upper part is yellowish brown, firm silty clay loam. The next part is yellowish brown and dark yellowish brown, mottled, firm silty clay loam. The lower part is yellowish brown, mottled, firm silt loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, firm silt loam. In some areas the surface layer is darker. In other areas the seasonal high water table is below a depth of 72 inches. In places carbonates are within a depth of 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Clarksdale and Keomah soils. These soils have more clay in the subsoil than the Rozetta soil and are less permeable. They are on ridgetops. They make up 10 to 15 percent of the unit.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during spring. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, hay, and woodland. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIe.

279C2—Rozetta silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is mixed dark brown and yellowish brown, friable silt loam about 6 inches thick. It has been thinned by water erosion. The subsoil is yellowish brown, firm and friable silty clay loam about 38 inches thick. It is mottled in the lower part. The underlying material to a depth of 60 inches or more is yellowish brown, mottled, friable silt loam. In some areas the surface layer is darker and thicker. In other areas the seasonal high water table is below a depth of 72 inches. In some places carbonates are within a depth of 40 inches. In other places a firm paleosol is

within a depth of 40 inches. In a few areas the slope is more than 10 percent.

Included with this soil in mapping are small areas of the somewhat poorly drained Clarksdale soils. These soils have more clay in the subsoil than the Rozetta soil and are less permeable. They are in nearly level areas above the Rozetta soil. They make up 2 to 5 percent of the unit.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during spring. Available water capacity is very high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture, hay, and woodland. It is moderately suited to dwellings and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIIe.

280C2—Fayette silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on side slopes in the uplands. Individual areas are irregular in shape and range from 3 to 100 acres in size.

Typically, the surface layer is brown, friable silt loam about 6 inches thick. It has been thinned by water erosion. The subsurface layer is yellowish brown, friable silt loam about 3 inches thick. The subsoil is about 47 inches thick. It is yellowish brown. The upper part is friable silty clay loam. The next part is firm silty clay loam. The lower part is friable silt loam. The underlying material to a depth of 60 inches is yellowish brown, friable silt loam. In some areas the surface layer is darker. In other areas the subsoil is mottled. In places carbonates are within a depth of 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Keomah soils. These soils are in nearly level areas above the Fayette soil. They make up 2 to 5 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture, hay, and woodland and to septic tank absorption fields. It is moderately suited to dwellings.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is

renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIIe.

280D2—Fayette silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 70 acres in size.

Typically, the surface layer is mixed brown and dark yellowish brown, friable silt loam about 9 inches thick. It has been thinned by water erosion. The subsoil is about 44 inches thick. It is dark yellowish brown. The upper part is firm silty clay loam. The lower part is mottled, friable silt loam. The underlying material to a depth of 60 inches or more is yellowish brown, mottled, friable silt loam. In some areas the upper part of the subsoil has gray mottles. In other areas carbonates are within a depth of 40 inches. In places the subsoil formed in glacial till.

Included with this soil in mapping are small areas of the somewhat poorly drained Orion soils. These soils formed in alluvium, are subject to flooding, and are in drainageways and on toe slopes below the Fayette soil. They make up 3 to 8 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops. It is well suited to pasture, hay, and woodland. It is moderately suited to dwellings and septic tank absorption fields.

Further water erosion is a hazard if this soil is used for corn, soybeans, or small grain. Also, deterioration of tilth is a problem. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to control water erosion. Stripcropping also helps to control water erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the slope and the shrink-swell potential are limitations. Cutting and filling help to overcome the slope. Reinforcing the foundations or extending them below the subsoil helps to prevent the structural damage caused by shrinking and swelling.

The slope is a limitation if this soil is used as a site for septic tank absorption fields. Installing the filter lines on the contour or cutting and filling help to overcome this limitation.

The land capability classification is IIIe.

280E—Fayette silt loam, 15 to 30 percent slopes. This steep, well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 45 acres in size.

Typically, the surface layer is mixed very dark gray and dark grayish brown, friable silt loam about 3 inches thick. The subsurface layer is yellowish brown, very friable silt loam about 6 inches thick. The subsoil is yellowish brown silty clay loam about 43 inches thick. The upper part is firm. The lower part is mottled and friable. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable silt loam. In some areas the subsoil formed in glacial till. In other areas thin layers of loamy fine sand are in the underlying material.

Included with this soil in mapping are small areas of the somewhat poorly drained Orion soils. These soils

formed in alluvium, are subject to flooding, and are in drainageways below the Fayette soil. They make up 10 to 15 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are used as pasture. Some areas are used as woodland. This soil is well suited to pasture, hay, and woodland. It generally is unsuited to cultivated crops and to dwellings and septic tank absorption fields.

A cover of pasture plants or hay helps to control water erosion. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing causes surface compaction and excessive runoff and water erosion. Proper stocking rates and timely deferment of grazing help to prevent overgrazing. A no-till method of seeding or pasture renovation helps to control water erosion. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, the hazard of water erosion and the equipment limitation are management concerns because of the slope. Plant competition also is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs and trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is VIe.

282F—Chute loamy fine sand, 18 to 35 percent slopes. This steep, excessively drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 185 acres in size.

Typically, the surface layer is mixed dark brown and brown, very friable loamy fine sand about 4 inches thick. The subsurface layer is dark yellowish brown, calcareous, very friable fine sand about 7 inches thick. The underlying material to a depth of 60 inches is yellowish brown, calcareous, loose fine sand. In some areas the underlying material contains less sand and more silt. In other areas it is gravelly. In places the soil formed in loess and glacial till.

Included with this soil in mapping are small areas of the moderately well drained Marseilles soils. These soils are not droughty and are moderately deep over shale and siltstone. They are in landscape positions similar to those of the Chute soil. They make up 5 to 10 percent of the unit.

Water and air move through the Chute soil at a rapid rate. Surface runoff is medium. Available water capacity and organic matter content are low. The shrink-swell potential and the potential for frost action also are low.

In most areas this soil is used as pasture or woodland. It is poorly suited to pasture and woodland. It generally is unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the slope.

In areas used as pasture, droughtiness and low fertility are limitations and soil blowing is a hazard. Selection of drought-tolerant grasses and legumes for planting helps to maintain or improve forage stands. Bromegrass, tall fescue, and alfalfa are suitable forage species. Frequently applying small amounts of fertilizer helps to prevent excessive loss of plant nutrients through leaching. Proper stocking rates, rotation grazing, and timely deferment of grazing help to keep the pasture in good condition and help to control soil blowing.

If this soil is used as woodland, the hazard of water erosion, the equipment limitation, seedling mortality, and plant competition are management concerns. Laying out logging roads and skid trails on the contour and seeding bare areas to grass or to a grass-legume mixture help to control water erosion. Skidding the logs or trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that can withstand droughty conditions, by eliminating the competing vegetation near the seedlings, and by selecting the larger and older nursery stock for planting. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is VIIs.

290A—Warsaw silt loam, 0 to 3 percent slopes. This nearly level, well drained soil is on flats on stream terraces. Individual areas are irregular in shape and range from 3 to 700 acres in size.

Typically, the surface layer is very dark grayish brown, very friable silt loam about 8 inches thick. The subsurface layer also is very dark grayish brown, very

friable silt loam about 8 inches thick. The subsoil is about 19 inches thick. It is dark brown. The upper part is very friable silty clay loam. The lower part is firm gravelly clay loam. The underlying material to a depth of 60 inches is dark yellowish brown, coarsely stratified, calcareous, loose very gravelly sand and sand. In some areas the surface layer and subsurface layer are thicker. In other areas, the subsoil contains less sand and the depth to sandy material is more than 40 inches.

Included with this soil in mapping are small areas of the excessively drained Chute soils. These soils have more sand in the upper part than the Warsaw soil. They are in the more sloping areas above the Warsaw soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Warsaw soil at a moderate rate and through the lower part at a very rapid rate. Surface runoff is slow. Available water capacity is moderate. Organic matter content also is moderate. The shrink-swell potential is low, and the potential for frost action is moderate.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay and to dwellings. It is poorly suited to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, the moderate available water capacity is a limitation. Applying a system of conservation tillage that leaves crop residue on the surface after planting and adding other organic material to the soil help to maintain fertility, increase the rate of water infiltration, and conserve moisture.

In areas used for pasture and hay, overgrazing reduces forage production and causes surface compaction, excess runoff, and deterioration of tilth. Proper stocking rates, rotation grazing, and timely deferment of grazing when the soil is wet help to keep the pasture in good condition. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species.

If this soil is used as a site for septic tank absorption fields, a poor filtering capacity is a limitation. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. The septic tank system can function satisfactorily if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed.

The land capability classification is IIs.

304B—Landes loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on low stream terraces, natural levees, and the higher parts of flood plains. It is subject to rare flooding. Individual areas are irregular in shape and range from 3 to 1,600 acres in size.

Typically, the surface layer is very dark brown, friable loam about 8 inches thick. The subsurface layer is dark brown, friable loam about 5 inches thick. The subsoil is about 25 inches thick. It is dark brown and calcareous. The upper part is friable loam. The lower part is friable and very friable fine sandy loam. The underlying material to a depth of 60 inches is dark brown, calcareous, stratified, very friable sandy loam and loamy sand. In some areas the surface layer contains more sand or gravel. In other areas the subsoil contains more clay.

Included with this soil in mapping are small areas of the poorly drained Beaucoup, somewhat poorly drained Paxico, and well drained Worthen soils. Beaucoup and Paxico soils are in shallow depressions below the Landes soil. Worthen soils contain less sand than the Landes soil. They are in landscape positions similar to those of the Landes soil or are in shallow depressions below the Landes soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the upper part of the Landes soil at a moderate or moderately rapid rate and through the lower part at a rapid rate. Surface runoff is slow. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential is low, and the potential for frost action is moderate.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, hay, and woodland. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the hazard of flooding and a poor filtering capacity, which can result in the pollution of ground water.

If this soil is used for corn, soybeans, or small grain, water erosion and soil blowing are hazards. Also, the moderate available water capacity and the level of fertility are limitations. Water erosion can be controlled and moisture conserved by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Field windbreaks and a tillage system that leaves the surface rough help to control soil blowing.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber

has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is IIe.

330—Peotone silty clay loam. This nearly level, very poorly drained soil is in shallow depressions on outwash plains and till plains. It is occasionally ponded for brief periods in spring. Individual areas are round or irregularly shaped and range from 3 to 250 acres in size.

Typically, the surface layer is black, firm silty clay loam about 8 inches thick. The subsurface layer is black and very dark gray, firm silty clay loam about 18 inches thick. The subsoil to a depth of more than 60 inches is mottled, firm silty clay loam. The upper part is very dark gray. The lower part is dark gray and gray. In some areas the subsurface layer is thinner. In other areas the soil contains less clay throughout. In places carbonates are within a depth of 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava and moderately well drained Tama soils. These soils are on slight rises and side slopes above the Peotone soil. Also included are soils that are ponded for long periods that extend into the growing season. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Peotone soil at a moderately slow rate. Surface runoff is very slow or ponded. The seasonal high water table is 0.5 foot above the surface to 1.0 foot below during spring. Available water capacity is high. Organic matter content also is high. The surface layer is firm and compact and is cloddy if it has been tilled when too wet. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is well suited to cultivated crops and to habitat for wetland wildlife. It is moderately suited to pasture and hay. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding.

If drained, this soil can be used for corn, soybeans, or small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

If this soil is used for pasture and hay, the ponding is a hazard. It can be controlled by surface drains, ditches, and surface inlet tile. Deferment of grazing when the soil is too wet helps to prevent surface compaction and deterioration of tilth. Canarygrass and alsike clover are suitable forage species. Proper stocking rates, rotation grazing, and applications of proper fertilizer help to keep the pasture in good condition.

The land capability classification is IIw.

344B—Harvard silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on ridgetops and side slopes on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, friable silt loam. The next part is dark yellowish brown, firm silty clay loam. The lower part is dark brown, friable loam and stratified friable loam, silt loam, sandy clay loam, and sandy loam. In some areas the lower part of the subsoil has less sand. In other areas the surface layer is lighter in color.

Included with this soil in mapping are small areas of the somewhat poorly drained Virgil soils. These soils are not subject to water erosion and are in low areas below the Harvard soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Harvard soil at a moderate rate and through the lower part at a moderately rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing,

timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling.

The moderate permeability is a limitation if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome this limitation.

The land capability classification is IIe.

386B—Downs silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is dominantly on ridgetops and the upper side slopes in the uplands. In a few areas it is on stream terraces. Individual areas are irregular in shape and range from 3 to 150 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown and yellowish brown, friable silty clay loam. The next part is yellowish brown, firm silty clay loam. The lower part is yellowish brown and light yellowish brown, mottled, friable silty clay loam and silt loam. In some areas the surface layer is lighter in color. In other areas it is thicker. In some places the slope is more than 5 percent, and in other places it is less than 1 percent.

Included with this soil in mapping are small areas of the poorly drained Denny soils. These soils are subject to ponding and are in depressions below the Downs soil. Also included, on the foot slopes of terraces, are soils that are subject to flooding. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Downs soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, hay, and woodland. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIe.

404—Titus silty clay loam. This nearly level, poorly drained soil is on broad flats and in narrow depressions and sloughs on flood plains. It is subject to rare flooding and to ponding. Individual areas are irregular in shape and range from 15 to 965 acres in size.

Typically, the surface layer is very dark gray, firm silty clay loam about 7 inches thick. The subsurface layer is very dark gray, mottled, firm silty clay about 5 inches thick. The subsoil is about 34 inches thick. It is dark gray and gray, mottled, and firm. The upper part is silty clay. The lower part is silty clay loam. The underlying material to a depth of 60 inches is light olive gray, mottled, calcareous, stratified, friable silt loam and loam. In places the subsoil contains less clay.

Included with this soil in mapping are small areas of somewhat poorly drained soils in the slightly higher landscape positions. These soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Titus soil at a slow rate and through the lower part at a moderately slow rate. Surface runoff is slow to ponded.

The seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential and the potential for frost action are high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops, hay, pasture, and woodland. It is well suited to habitat for wetland wildlife. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding and the ponding.

Where a system of levees and open drainage ditches has been installed to control the flooding and reduce the wetness, this soil can be used for corn, soybeans, or small grain. Measures that maintain the levees and ditches are needed. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as woodland, the equipment limitation, seedling mortality, and windthrow are management concerns. They are caused by the wetness. Plant competition also is a management concern. It hinders the growth of desirable seedlings. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting on ridges, by selecting nursery stock that is older and larger than is typical, or by mulching. Some replanting may be needed. Removing high-value trees only from a strip 50 feet wide along the west and south edges of the woodland and using harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Plant competition can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is IIIw.

406—Paxico silt loam, frequently flooded, brief duration. This nearly level, somewhat poorly drained soil is on flats and slight rises on flood plains. It is frequently flooded for brief periods from March through May. Individual areas are irregular in shape and range from 2 to 400 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The underlying material to a depth of 60 inches is dark grayish brown, brown, dark yellowish brown, and grayish brown, mottled, calcareous, friable and very friable silt loam. It has thin strata of loam and fine sandy loam in the lower part. In some areas the surface layer is thicker and darker. In other areas a dark buried soil is within a depth of 40 inches.

Included with this soil in mapping are small areas of the excessively drained Sarpy soils. These soils are droughty. They are in areas above the Paxico soil. They make up 5 to 10 percent of the unit.

Water and air move through the Paxico soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1.5 to 3.0 feet below the surface during spring. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is low, and the potential for frost action is high.

Most areas are cultivated. Some areas are used for pasture, hay, or woodland. This soil is well suited to woodland. It is moderately suited to cultivated crops, pasture, and hay. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard. Also, the seasonal high water table delays planting in some years. Dikes or diversions reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and to wetter soil conditions also reduces the extent of this damage. Subsurface tile drains function satisfactorily if suitable outlets are available. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

If this soil is used for pasture or hay, the flooding is a hazard and the seasonal high water table is a limitation. Dikes and diversions help to control the flooding, and subsurface tile drains help to lower the water table. Overgrazing causes surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years. Bromegrass, orchardgrass, and alsike clover are suitable forage species.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is IIIw.

415—Orion silt loam. This nearly level, somewhat poorly drained soil is on slight rises on flood plains and in drainageways in the uplands. It is frequently flooded for brief periods from March through November. Individual areas are irregular in shape and range from 3 to 60 acres in size.

Typically, the surface layer is dark grayish brown and brown, friable silt loam about 6 inches thick. It has thin layers of brown, friable loam. The underlying material extends to a buried soil at a depth of about 24 inches. It is stratified dark grayish brown, brown, and very dark gray, friable silt loam. The upper part of the buried soil is black and very dark gray, mottled, friable silt loam. The lower part to a depth of 60 inches is stratified dark grayish brown and brown, mottled, friable silt loam. In some areas the buried soil is below a depth of 40 inches. In other areas the surface layer is thicker and darker.

Included with this soil in mapping are small areas of the well drained Huntsville and poorly drained Sawmill soils. Huntsville soils are nearer to the streams and slightly higher on the landscape than the Orion soil. Sawmill soils have more clay than the Orion soil. They are in old oxbows and sloughs below the Orion soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Orion soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential is low, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops, pasture, hay, and woodland. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard. Also, the seasonal high water table delays planting in some years. Dikes or diversions reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and to wetter soil conditions also reduces the extent of this damage. Subsurface tile drains function satisfactorily if suitable outlets are available. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

If this soil is used for pasture or hay, the flooding is a hazard and the seasonal high water table is a limitation. Dikes and diversions help to control the flooding, and subsurface tile drains help to lower the water table. Overgrazing causes surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years. Bromegrass, orchardgrass, tall fescue, alfalfa, and alsike clover are suitable forage species.

If this soil is used as woodland, the equipment limitation is a management concern. Plant competition also is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Machinery should be used only when the soil is firm enough to support the equipment. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is IIIw.

439B—Jasper loam, sandy substratum, 1 to 4 percent slopes. This gently sloping, well drained soil is on ridgetops and side slopes on outwash plains and stream terraces. Individual areas are irregular in shape and range from 3 to 400 acres in size.

Typically, the surface layer is very dark grayish brown, friable loam about 10 inches thick. The subsurface layer is very dark grayish brown, friable loam about 8 inches thick. The subsoil is about 28 inches thick. It is friable. The upper part is brown clay loam. The next part is brown sandy clay loam. The lower part is dark brown loamy sand. The underlying material to a depth of 60 inches is brown, loose loamy sand. In some areas the upper part of the subsoil contains less clay. In other areas the sandy material is within a depth of 40 inches.

Included with this soil in mapping are small areas of the excessively drained Plainfield soils. These soils are sandy and droughty. They are in landscape positions similar to those of the Jasper soil. They make up less than 10 percent of the unit.

Water and air move through the upper part of the Jasper soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential is low, and the potential for frost action is moderate.

Most areas are used for cultivated crops or hay. This soil is well suited to cultivated crops, hay, and pasture and to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

The land capability classification is IIe.

451—Lawson silt loam. This nearly level, somewhat poorly drained soil is on slight rises on flood plains. It is frequently flooded for brief periods from March through June. Individual areas are long and narrow and range from 3 to 300 acres in size.

Typically, the surface layer is very dark gray, very friable silt loam about 9 inches thick. The subsurface layer is black, very dark gray, and very dark grayish brown, friable silt loam about 36 inches thick. It is mottled in the lower part. The underlying material to a depth of 60 inches is grayish brown, mottled, friable silt loam. In some areas a buried soil high in content of clay is within a depth of 40 inches. In other areas the subsurface layer is thinner.

Included with this soil in mapping are small areas of the well drained Dorchester and Huntsville soils. Huntsville soils are nearer to the streams and slightly higher on the landscape than the Lawson soil. Dorchester soils are in landscape positions similar to those of the Lawson soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Lawson soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is very high. Organic matter content is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops, pasture, and hay. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard. Also, the seasonal high water table delays planting in some years. Dikes or diversions reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and to wetter soil conditions also reduces the extent of this damage. Subsurface tile drains function satisfactorily if suitable outlets are available. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

If this soil is used for pasture or hay, the flooding is a hazard and the seasonal high water table is a limitation. Dikes and diversions help to control the flooding, and subsurface tile drains help to lower the water table. Overgrazing causes surface compaction and deterioration of tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years. Bromegrass, orchardgrass, tall fescue, alfalfa, and alsike clover are suitable forage species.

The land capability classification is IIIw.

533—Urban land. This map unit occurs as areas covered by buildings; sewage treatment plants; asphalt, cinder, and concrete pavement; and railroad tracks. Because of extensive land shaping, it generally is nearly level to gently sloping. It is mainly in the industrial and commercial areas of Peoria. Individual areas are rectangular and range from 3 to 1,000 acres in size.

More than 85 percent of this map unit is covered by pavement or buildings. The areas consist of parking lots, educational institutions, commercial facilities, and shopping centers.

Included in this map unit are small areas of silty, gently sloping Orthents. These soils make up less than 15 percent of the unit.

Runoff generally is very rapid on the Urban land. The paved areas commonly are designed so that they conduct runoff into storm drainage systems. Because runoff is rapid, the amount of water available for trees and shrubs generally is low.

The vegetation in areas of this unit consists mainly of grasses at the border of the urban areas and widely spaced trees and shrubs. Vegetated areas make up less than 10 percent of the unit. Special management is needed when trees and shrubs are planted and after they are established. Periodic supplemental watering also is needed.

This map unit is not assigned to a land capability classification.

536—Dumps, mine. This nearly level to very steep map unit occurs as areas where refuse has accumulated because of the washing and separation of coal. Individual areas are irregularly shaped or fan shaped and range from 3 to 120 acres in size.

The material in this unit consists of shale and siltstone fragments, sandstone cobbles, coal fragments, and loamy overburden. It is loam, clay loam, silty clay loam, silt loam, or the shaly analogs of those textures. The material is dominantly gray to black, but in some areas it is bright red because of burning. It is extremely acid, as are included small water areas. Escarpments

are near the water areas and in areas where the unit is adjacent to natural soils.

Surface runoff is ponded or is slow to very rapid. The material is compacted and is easily eroded. The runoff is acid and is toxic to most plants. The nearly level areas are wet. Depth to the water table has not been determined. The material has practically no organic matter.

This unit is idle. It supports no vegetation, except for cottonwood, wild cherry, and boxelder in the small included areas of natural soils.

If reclaimed, some areas have limited potential for low-intensity recreational uses, such as shooting ranges and paths and trails. The major management concerns are the wetness in the nearly level areas and water erosion and toxic runoff in the more sloping areas and in areas that are at a higher elevation than a drainageway, a crop field, or an area of deep water. Reclamation would include land grading and shaping and topdressing with natural soil material. The feasibility and extent of reclamation depend on conditions determined by onsite investigation and on the intended use.

This map unit is not assigned to a land capability classification.

549C2—Marseilles silt loam, 5 to 10 percent slopes, eroded. This sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are long and narrow and range from 10 to 40 acres in size.

Typically, the surface layer is brown and dark yellowish brown, friable silt loam about 5 inches thick. The subsoil is friable silty clay loam about 21 inches thick. The upper part is dark yellowish brown, the next part is yellowish brown, and the lower part is light olive brown. Firm, silty shale is at a depth of about 26 inches. In some places the soil contains more clay. In other places the shale is calcareous. In some areas the soil contains more sand and is underlain by sandstone bedrock.

Included with this soil in mapping are small areas of the somewhat poorly drained Lawson and Orion soils and the well drained Hickory soils. Lawson and Orion soils are subject to flooding and are in drainageways below the Marseilles soil. Hickory soils formed dominantly in glacial till. They are in landscape positions similar to those of the Marseilles soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Marseilles soil at a moderate rate and through the lower part at a slow rate. Surface runoff is medium. The seasonal high water table is perched 1.5 to 3.5 feet below the surface in late winter and in spring. Available water capacity is moderate. Organic matter content is moderately low. The soft shale or siltstone bedrock at a depth of 20 to 40 inches restricts the rooting depth of some plants. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. Some areas are used for pasture. This soil is poorly suited to cultivated crops and moderately suited to hay, pasture, and woodland. It is moderately suited to dwellings. It generally is unsuitable as a site for septic tank absorption fields because of the depth to bedrock and the slow permeability.

If this soil is used for corn, soybeans, or small grain, further water erosion is the main hazard. A conservation tillage system that leaves crop residue on the surface after planting, a crop rotation that includes several years of forage crops, and terraces help to control water erosion.

Establishing pasture and hay crops helps to control water erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and prevent surface compaction and excessive runoff. A no-till method of pasture renovation or seeding helps to control water erosion. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, excluding livestock and preventing fires are the only management concerns. Excluding livestock helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is IVe.

549E—Marseilles silt loam, 15 to 30 percent slopes. This steep, moderately well drained, moderately deep soil is on side slopes and foot slopes in the uplands. Individual areas are long and narrow and range from 3 to 300 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 6 inches thick. The subsurface layer is brown, friable silt loam about 4 inches thick. The subsoil is firm silty clay loam about 29 inches thick. The upper part is yellowish brown. The next part is yellowish brown and mottled. The lower part is olive and mottled. Light olive brown, soft shale is at a depth of about 39 inches. In some areas the soft shale is calcareous. In other areas the subsoil is thinner. In places the surface layer and subsoil contain more clay.

Included with this soil in mapping are small areas of the moderately well drained Elco, well drained Hickory, and somewhat poorly drained Lawson and Orion soils. These soils do not have shale or siltstone within a

depth of 60 inches. Elco soils are on side slopes above the Marseilles soil. Hickory soils are on side slopes above the Marseilles soil or are in landscape positions similar to those of the Marseilles soil. Lawson and Orion soils are in the drainageways below the Marseilles soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Marseilles soil at a moderate rate and through the lower part at a slow rate. Surface runoff is rapid. The seasonal high water table is perched 1.5 to 3.5 feet below the surface in late winter and in spring. Available water capacity is moderate. Organic matter content is moderately low. The soft shale or siltstone bedrock at a depth of 20 to 40 inches restricts the rooting depth of some plants. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is used as woodland. It is moderately suited to woodland and to habitat for woodland wildlife. It generally is unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the slope.

Establishing pasture and hay crops helps to control water erosion. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing causes surface compaction and excessive runoff and water erosion. Proper stocking rates and timely deferment of grazing help to prevent overgrazing. A no-till method of seeding or pasture renovation helps to control water erosion. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as woodland, the hazard of water erosion and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs and trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

Trees and shrubs can be easily established on this soil. The existing stands of trees provide good habitat for woodland wildlife. Protection from fire and grazing helps to prevent depletion of the shrubs and sprouts that provide food and cover for the wildlife.

The land capability classification is VIIe.

549G—Marseilles silt loam, 30 to 60 percent slopes. This very steep, moderately well drained, moderately deep soil is on side slopes in the uplands. Individual areas are long and narrow and range from 3 to 800 acres in size.

Typically, the surface layer is very dark brown, friable silt loam about 4 inches thick. The subsoil is silt loam about 32 inches thick. The upper part is light olive brown and friable. The next part is light olive brown and firm. The lower part is olive and firm. Olive, very firm, soft silty shale and siltstone bedrock is at a depth of about 36 inches. In some areas the bedrock is sandstone. In other areas, the bedrock is calcareous and the soil is less acid throughout. In places the surface layer is silty clay loam.

Included with this soil in mapping are small areas of the well drained Hickory, well drained and moderately well drained Sylvan, moderately well drained Elco, and somewhat poorly drained Lawson and Orion soils. These soils do not have bedrock within a depth of 60 inches. Elco, Hickory, and Sylvan soils are in landscape positions similar to those of the Marseilles soil or are on side slopes above the Marseilles soil. Lawson and Orion soils are in drainageways below the Marseilles soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Marseilles soil at a moderate rate and through the lower part at a slow rate. Surface runoff is rapid. The seasonal high water table is perched 1.5 to 3.5 feet below the surface in late winter and in spring. Available water capacity is moderate. Organic matter content is moderately low. The soft shale or siltstone bedrock at a depth of 20 to 40 inches restricts the rooting depth of some plants. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is used as woodland and habitat for woodland wildlife (fig. 7). It is moderately suited to woodland and to habitat for woodland wildlife. It generally is unsuited to cultivated crops, pasture, and hay and to dwellings and septic tank absorption fields because of the slope.

If this soil is used as woodland, the hazard of water erosion and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs and trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm



Figure 7.—A wooded area of Marseilles silt loam, 30 to 60 percent slopes. Soil slumping is common in areas of this soil.

enough to support the equipment. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

Trees and shrubs can be easily established on this soil. The existing stands of trees provide good habitat for woodland wildlife. Protection from fire and grazing helps to prevent depletion of the shrubs and sprouts that provide food and cover for the wildlife.

The land capability classification is VIIe.

567B2—Elkhart silty clay loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are irregular in shape and range from 3 to 240 acres in size.

Typically, the surface layer is mixed very dark grayish brown and dark yellowish brown, friable silty clay loam about 8 inches thick. It has been thinned by water erosion. The subsoil is dark yellowish brown, firm silty clay loam about 28 inches thick. It is mottled in the lower few inches. The underlying material to a depth of 60 inches or more is yellowish brown, mottled, friable, calcareous silt loam. In some areas, the subsoil is thicker and the depth to carbonates is more than 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Radford soils. These soils are subject to flooding and are in drainageways below the Elkhart soil. They make up 2 to 5 percent of the unit.

Water and air move through the Elkhart soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface in spring. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, further water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIe.

567C2—Elkhart silty clay loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on side slopes in the uplands. Individual areas are irregular in shape and range from 3 to 400 acres in size.

Typically, the surface layer is mixed very dark grayish brown and brown, friable silty clay loam about 8 inches thick. It has been thinned by water erosion. The subsoil is about 31 inches thick. The upper part is brown, friable silty clay loam. The next part is yellowish brown, firm silty clay loam. The lower part is yellowish brown, mottled, calcareous, friable silt loam. The underlying material to a depth of 60 inches or more is brown, mottled, calcareous, friable silt loam. In some areas, the subsoil is thicker and the depth to carbonates is more than 40 inches. In other areas the lower part of the subsoil has a higher content of clay and sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Radford soils. These soils are subject to flooding and are in drainageways below the Elkhart soil. They make up 5 to 10 percent of the unit.

Water and air move through the Elkhart soil at a moderate rate. Surface runoff is medium. The seasonal high water table is 4 to 6 feet below the surface in spring. Available water capacity is very high. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is moderately suited to cultivated crops and to dwellings and septic tank absorption fields. It is well suited to pasture and hay.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of

tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

The land capability classification is IIIe.

709A—Osceola silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on wide ridges and flats in the uplands. Individual areas are irregular in shape and range from 10 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is grayish brown, friable silt loam about 6 inches thick. The subsoil is about 32 inches thick. It is mottled. In sequence downward, it is dark grayish brown, firm silty clay; light brownish gray, firm silty clay loam; grayish brown and brown sandy clay loam; and gray, mottled silty clay. Gray, soft, weathered silty clay shale is at a depth of about 47 inches. In some areas the subsoil contains less clay. In other areas it is thicker. In some places the lower part of the subsoil contains more sand. In other places the seasonal high water table is within 1 foot of the surface.

Included with this soil in mapping are small areas of the poorly drained Drummer soils. These soils are on broad flats and in shallow depressions and drainageways below the Osceola soil. They make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Osceola soil at a moderate rate and through the lower part at a slow rate. Surface runoff is slow. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is high. Organic matter content is moderate. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

Wetness is the main limitation in areas used for crops. Measures that maintain or improve a drainage system are needed. Subsurface tile drains or surface ditches can help to remove excess water if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and productivity.

Climatically adapted pasture and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundations helps to overcome the wetness.

The seasonal high water table and the slow permeability are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table. Grading and land shaping help to remove excess surface water. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the slow permeability.

The land capability classification is IIw.

709B2—Osceola silt loam, 2 to 5 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on ridgetops and side slopes in the uplands. Individual areas are irregular in shape and range from 10 to 200 acres in size.

Typically, the surface layer is mixed very dark

grayish brown and grayish brown, friable silt loam about 8 inches thick. The subsoil is mottled, firm silty clay loam about 34 inches thick. The upper part is grayish brown. The next part is gray and light gray. The lower part is olive gray, light gray, and yellowish brown. Gray, olive, and yellowish brown, mottled, soft, weathered silty clay shale is at a depth of about 42 inches. In some places the subsoil contains more clay. In other places it is thicker. In some areas the lower part of the subsoil contains more sand. In other areas the seasonal high water table is within 1 foot of the surface.

Included with this soil in mapping are small areas of the well drained Marseilles and Proctor soils. These soils are in landscape positions similar to those of the Osceola soil. They make up 2 to 10 percent of the unit.

Water and air move through the upper part of the Osceola soil at a moderate rate and through the lower part at a slow rate. Surface runoff is medium. The seasonal high water table is 1 to 3 feet below the surface during spring. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, further water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, reed canarygrass, and red clover are suitable forage species. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as woodland, plant competition is a management concern. It can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundations helps to overcome the wetness.

The seasonal high water table and the slow permeability are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table. Grading and land shaping help to remove excess surface water. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the slow permeability.

The land capability classification is IIe.

857G—Strawn-Hennepin loams, 30 to 60 percent slopes. These very steep, well drained soils are on side slopes in the uplands. The Strawn soil is on the upper or less sloping parts of the side slopes, and the Hennepin soil is on the lower or more sloping parts. Individual areas are long and narrow or irregularly shaped and range from 5 to 4,700 acres in size. They are about 45 to 60 percent Strawn soil and 25 to 40 percent Hennepin soil. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the Strawn soil has a surface layer of very dark grayish brown, friable loam about 4 inches thick. The subsurface layer is brown, friable loam about 4 inches thick. The subsoil is brown, firm clay loam about 18 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is brown, calcareous, very firm clay loam. In some areas, the subsoil is thicker and carbonates are below a depth of 30 inches. In other areas the slope is less than 30 percent.

Typically, the Hennepin soil has a surface layer of very dark grayish brown, calcareous, friable loam about 4 inches thick. The subsoil is brown, calcareous, friable loam about 12 inches thick. The underlying material to a depth of 60 inches is brown, calcareous, firm loam. In places the slope is more than 60 percent.

Water and air move through the upper part of the Strawn soil at a moderate rate and through the lower part at a moderately slow rate. They move through the Hennepin soil at a moderately slow rate. Surface runoff is rapid on both soils. Available water capacity is moderate. Organic matter content is moderately low. The shrink-swell potential is moderate in the Strawn soil and low in the Hennepin soil. The potential for frost action is moderate in both soils.

Most areas are used as woodland. Some areas are used for residential development. These soils are generally unsuited to cultivated crops, pasture, and hay and to dwellings and septic tank absorption fields because of the slope. They are moderately suited to woodland.

If these soils are used as woodland, the hazard of water erosion, the equipment limitation, and seedling



Figure 8.—An area of Pits, quarries, used as a source of crushed limestone.

mortality are management concerns. Plant competition also is a management concern. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs or trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soils are firm enough to support the equipment. The seedling mortality rate can be reduced by eliminating competing vegetation from the areas near the seedlings and by selecting the older and larger seedlings for planting. Some replanting may be needed. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The land capability classification is VIIe.

864—Pits, quarries. This map unit consists of excavations from which limestone has been or is currently being removed (fig. 8). Individual areas are irregular in shape and range from 10 to 350 acres in size.

Typically, stockpiles of rock fragments and included areas of other spoil material are within or surround the excavation. Some included areas have sufficient soil material to support vegetation. Small water areas are included in places.

Abandoned quarries that include water areas are suited to fishing, boating, camping, hiking, and swimming. Reclaiming these quarries by land grading and shaping and by covering bare areas with soil material increases the number of possible uses. The feasibility and extent of reclamation depend on the desired alternative use and individual site conditions.

This map unit is not assigned to a land capability classification.

865—Pits, gravel. This map unit consists of excavations from which sand and gravel have been or are currently being removed. Individual areas are round or irregularly shaped and range from 4 to 375 acres in size.

Typically, stockpiles of sand and gravel and of spoil material are within or surround the excavation. Some included areas have sufficient soil material to support vegetation.

Included in this map unit are some small areas of natural soils on haulage roads or lanes. Also included are some small water areas.

The pits that contain water are suited to recreational activities, including boating, fishing, and swimming, and to habitat for waterfowl. Camping and hiking are possible in the surrounding areas. The pits that contain no water are suited to hiking and in some areas to openland wildlife habitat if sufficient soil material can be spread over the surface to allow for plant growth. These pits, especially the smaller ones, can be reclaimed by land grading, shaping, and filling. Reclamation increases the number of possible uses. The feasibility and extent of reclamation depend on the desired alternative uses and individual site conditions.

This map unit is not assigned to a land capability classification.

871B—Lenzburg silt loam, 1 to 7 percent slopes, stony. This gently sloping, well drained soil is on ridgetops and side slopes in graded surface-mined areas. Individual areas are irregular in shape and range from 3 to 1,400 acres in size.

Typically, the surface layer is mixed dark grayish brown, brown, and light gray silt loam about 3 inches thick. Stones are about 25 to 50 feet apart on the surface. The upper part of the underlying material is mixed very dark gray, brown, and pinkish gray, calcareous, firm silt loam about 7 inches thick. The lower part to a depth of 60 inches is mixed dark brown, light gray, and brownish yellow, mottled, calcareous, firm silt loam and silty clay loam. Shale channers are common throughout the profile. A few scattered stones and boulders are on the surface and throughout the profile. In some areas the soil has fewer rock fragments.

Included with this soil in mapping are small areas of haulage roads; some steep and very steep, unleveled areas adjacent to pits and the final cuts; and shallow trenches and depressions, some of which contain water. Also included are a few water areas. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Lenzburg soil at a moderately slow rate. Surface runoff is medium. Available water capacity is moderate. Organic matter content is low. The content of rock fragments is 10 to 35 percent by volume. Differential settling can occur in areas of this soil. The rocks and dense soil fragments in the underlying material tend to restrict the rooting depth. The shrink-swell potential and the potential for frost action are moderate.

Most areas are used for pasture and hay. This soil is moderately suited to pasture, hay, and woodland. It is well suited to habitat for openland and woodland wildlife. It is moderately suited to dwellings and septic tank absorption fields. It generally is unsuited to cultivated crops because of surface stoniness.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, tall fescue, and alfalfa are suitable forage species. Water erosion is a hazard, and short slopes, depressions, and surface stones are limitations. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion. Applying a no-till method of pasture renovation and seeding on the contour help to control water erosion. The plants should not be grazed or clipped until they are sufficiently established. The stoniness may restrict the use of some machinery. Seed should be planted and fertilizer applied by airplane or by hand in certain areas. Overgrazing causes surface compaction and excessive runoff and increases the susceptibility to water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

This soil is suitable for the grain and seed crops and the grasses and legumes, such as bromegrass, orchardgrass, ladino clover, alsike clover, and red clover, that are necessary habitat elements for openland wildlife. Measures that protect the habitat from grazing are needed. The shallow depressions and the areas of deep water provide resting and nesting sites for waterfowl. The areas of deep water can be used for fishing and boating.

If this soil is used as a site for dwellings, the shrink-swell potential and the differential settling are limitations. Reinforcing foundations helps to prevent the structural damage caused by shrinking and swelling. The soil should be allowed to settle naturally for several years before it is used as a site for dwellings.

The moderately slow permeability is a limitation if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome this limitation.

The land capability classification is VIe.

871D—Lenzburg silt loam, 7 to 20 percent slopes, stony. This strongly sloping, well drained soil is on graded side slopes in surface-mined areas. Individual

areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is olive gray, calcareous, friable silt loam about 3 inches thick. Stones are about 25 to 50 feet apart on the surface. The underlying material to a depth of 60 inches is mixed yellowish brown, brown, light brownish gray, and brownish yellow, calcareous, firm silt loam and silty clay loam. Shale channers are common throughout the profile. A few scattered stones and boulders are on the surface and throughout the profile. In some areas the soil has fewer rock fragments.

Included with this soil in mapping are haulage roads and lanes used for transporting the mined coal and some steep and very steep soils in scattered areas throughout the unit and in areas adjacent to pits and to the final cut. Also included are shallow trenches and depressions, which often contain water. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Lenzburg soil at a moderately slow rate. Surface runoff is rapid. Available water capacity is moderate. Organic matter content is low. The content of rock fragments is 10 to 35 percent by volume. Some areas are subject to differential settling. The rocks and dense soil fragments in the underlying material tend to restrict the rooting depth. The shrink-swell potential and the potential for frost action are moderate.

In most areas this soil is used for pasture. It is moderately suited to pasture and woodland. It is well suited to habitat for openland and woodland wildlife. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the slope, the moderately slow permeability, the stoniness, and the differential settling.

Climatically adapted forage plants grow well on this soil. Bromegrass, tall fescue, and alfalfa are suitable forage species. Water erosion is a hazard, and short slopes and surface stones are limitations. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion. Applying a no-till method of pasture renovation or seeding on the contour helps to control water erosion. The plants should not be grazed or clipped until they are sufficiently established. Seed should be planted and fertilizer applied by airplane or by hand in certain areas. The stoniness may restrict the use of some machinery. Overgrazing causes surface compaction and excessive runoff and increases the susceptibility to water erosion.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

This soil is suitable for the grain and seed crops and the grasses and legumes, such as bromegrass, orchardgrass, ladino clover, alsike clover, and red clover, that are necessary habitat elements for openland wildlife. Measures that protect the habitat from fire and grazing are needed. The shallow depressions and the areas of deep water provide nesting sites for certain types of waterfowl.

The land capability classification is VIe.

871G—Lenzburg silt loam, 20 to 60 percent slopes, stony. This very steep, well drained soil is on the crests, side slopes, and troughs of spoil banks in surface-mined areas that have a ridge-and-swale topography. Slopes are generally 50 to 100 feet long. Individual areas are irregular in shape and range from 3 to 500 acres in size.

Typically, the surface layer is grayish brown, calcareous, firm silt loam about 3 inches thick. Stones are about 25 to 50 feet apart on the surface. The underlying material to a depth of 60 inches is multicolored, calcareous, firm silty clay loam. It is mottled in the lower part. Shale channers are common throughout the profile. In some areas the ridgetops have been leveled.

Included with this soil in mapping are small areas of soils in depressions and trenches, many of which contain water. Also included are less sloping haulage roads and construction areas where coal-processing machinery was located during mining activities. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Lenzburg soil at a moderately slow rate. Surface runoff is very rapid. Available water capacity is moderate. Organic matter content is low. The content of rock fragments is 10 to 35 percent by volume. The rocks and dense soil fragments in the underlying material tend to restrict the rooting depth. The shrink-swell potential and the potential for frost action are moderate.

Most of the acreage is idle land. Some areas have dense stands of trees. Some support grasses and are used as pasture. Others are recreational areas used for hunting and fishing. This soil is well suited to habitat for woodland wildlife. It is moderately suited to woodland. It generally is unsuited to cultivated crops, hay, and pasture and to dwellings and septic tank absorption fields because of the slope.

If this soil is used as woodland, the hazard of water

erosion and the equipment limitation are management concerns. They are caused by the slope. Plant competition also is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Laying out logging roads and skid trails on the contour and seeding bare logging areas to grass or to a grass-legume mixture help to control water erosion. Skidding logs and trees uphill with a cable and winch helps to overcome the slope. Firebreaks should be the grass type. Machinery should be used only when the soil is firm enough to support the equipment. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The dense stands of timber provide good habitat for woodland wildlife. This soil is suitable for grain and seed crops, wild herbaceous plants, and hardwoods. Measures that protect the habitat from fire and grazing help to prevent depletion of the shrubs and sprouts that provide food and cover for the wildlife.

The numerous shallow ponds and areas of deep water provide good opportunities for fishing and boating. A large number of Canada geese and numerous species of ducks use the shallow ponds and surrounding cover as nesting areas. Some of the areas where ridgetops have been leveled are well suited to hiking.

The land capability classification is VIIe.

872B—Rapatee silt loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on ridgetops and side slopes in surface-mined areas. The original surface soil was replaced during reclamation. Individual areas are irregular in shape and range from 3 to 735 acres in size.

Typically, the surface layer is mixed very dark gray and light yellowish brown, friable silt loam about 4 inches thick. The upper part of the underlying material is the original surface soil material. It is mixed black and light yellowish brown, firm silt loam about 11 inches thick. Below this to a depth of 60 inches is overburden of light olive and dark greenish gray, calcareous, very firm and firm silt loam and silty clay loam. In some areas spoil material is at the surface. In other areas the soil has as much as 20 percent coarse fragments throughout.

Included with this soil in mapping are small areas of the somewhat poorly drained Ipava, poorly drained Sable, and moderately well drained Tama soils. These soils are in undisturbed areas along the borders of the map unit. Also included are steep and very steep soils adjacent to pits and the final cuts and soils in shallow depressions that contain water. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Rapatee soil at a moderately slow or slow rate. Surface runoff is medium. Available water capacity is moderate. Organic matter content also is moderate. The dense, very firm underlying material tends to restrict the rooting depth. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, water erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces. Returning crop residue to the soil and adding other organic material improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to water erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control water erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a site for septic tank absorption fields, the moderately slow or slow permeability is a limitation. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome this limitation.

The land capability classification is IIe.

872C—Rapatee silty clay loam, 5 to 12 percent slopes. This moderately sloping, well drained soil is on ridgetops and side slopes in surface-mined areas. The original surface soil was replaced during reclamation. Individual areas are irregular in shape and range from 3 to 30 acres in size.

Typically, the surface layer is mixed very dark gray and yellowish brown, friable silty clay loam about 5 inches thick. The upper 11 inches of the underlying material is the original surface soil material. It is mixed very dark gray and yellowish brown, firm silty clay loam. Below this to a depth of 60 inches is overburden of mixed yellowish brown, light olive brown, and gray, calcareous, firm and very firm silty clay loam. In some

areas the soil has as much as 20 percent coarse fragments throughout. In other areas it is noncalcareous.

Included with this soil in mapping are small areas of steep and very steep soils adjacent to the final cuts and soils in shallow depressions that contain water. Included soils make up less than 10 percent of the unit.

Water and air move through the Rapatee soil at a moderately slow or slow rate. Surface runoff is medium. Available water capacity is moderate. Organic matter content also is moderate. The underlying material tends to limit root growth. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further water erosion is a hazard and deterioration of tilth is a limitation. Water erosion can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by terraces. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity, prevent crusting, and improve tilth.

Climatically adapted pasture and hay plants grow well on this soil. Bromegrass, orchardgrass, tall fescue, and alfalfa are suitable forage species. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction and excessive runoff and water erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control water erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings, the slope and the shrink-swell potential are limitations. Cutting and filling help to overcome the slope. Extending foundation footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The slow or moderately slow permeability and the slope are limitations if this soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

The land capability classification is IIIe.

2017—Keomah-Urban land complex. This map unit consists of a nearly level, somewhat poorly drained Keomah soil intermingled with areas of Urban land. It is on smooth flats. Individual areas are polygonal or irregularly shaped and range from 40 to 400 acres in size. They are about 50 to 80 percent Keomah soil and 15 to 45 percent Urban land. The Keomah soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Keomah soil is dark gray, very friable silt loam about 7 inches thick. The subsurface layer is grayish brown loam about 14 inches thick. The subsoil is friable silty clay loam about 25 inches thick. The upper part is dark yellowish brown. The lower part is grayish brown. The underlying material to a depth of 60 inches is mottled light brownish gray and yellowish brown, friable silt loam. Some low areas and some areas adjacent to developments have been filled or leveled during construction. In places the slope is more than 2 percent.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure the soils that identification of the soil series is not possible.

Included in this map unit are small areas of the poorly drained Rushville soils. These soils are subject to ponding and are in shallow depressions below the Keomah soil. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Keomah soil at a moderate rate and through the lower part at a slow or moderately slow rate. The seasonal high water table is 2 to 4 feet below the surface during spring. Surface runoff is slow on the Keomah soil and rapid on the Urban land. Available water capacity is high in the Keomah soil. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are high.

The Keomah soil is used for parks, building site development, lawns, or gardens. It is moderately suited to lawns, flower and vegetable gardens, trees and shrubs, and recreational uses. It is poorly suited to dwellings and septic tank absorption fields.

If the Keomah soil is used for lawns, gardens, or trees and shrubs, the seasonal high water table is a limitation. Several methods of artificial drainage can be successful on this soil. Surface ditches and subsurface tile function well if outlets are available. Onsite investigation is needed to determine the best method for draining a particular area.

If the Keomah soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing

the foundations helps to prevent the structural damage caused by shrinking and swelling.

Most homes and commercial buildings in areas of this unit are connected to a municipal sewer and waste-treatment facility. The slow permeability and the seasonal high water table are limitations if the Keomah soil is used as a site for septic tank absorption fields. The septic tank system can function satisfactorily if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed.

Low strength, the shrink-swell potential, and the potential for frost action are limitations if the Keomah soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by low strength, shrinking and swelling, and frost action. Installing a drainage system and then grading the roads so that they shed water reduce the wetness and thus help to prevent the damage caused by shrinking and swelling and by frost action.

This map unit is not assigned to a land capability classification.

2036B—Tama-Urban land complex, 1 to 5 percent slopes. This map unit consists of a gently sloping, moderately well drained Tama soil intermingled with areas of Urban land. It is on ridgetops and side slopes. Individual areas are irregularly shaped and range from 80 to 870 acres in size. They are about 45 to 55 percent Tama soil and 30 to 40 percent Urban land. The Tama soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Tama soil is very dark grayish brown, friable silt loam about 12 inches thick. The subsoil extends to a depth of more than 60 inches. It is friable. The upper part is brown silt loam. The next part is brown silty clay loam. The lower part is dark yellowish brown, mottled silty clay loam. In some areas the surface layer is lighter in color. In other areas, the subsoil is thinner and carbonates are within a depth of 40 inches. In places the surface layer is covered by as much as 1 to 2 feet of fill material.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure the soils that identification of the soil series is not possible.

Included in this map unit are small areas of the poorly drained Denny and Sable soils. These soils are subject to ponding and are in depressions and drainageways below the Tama soil. They make up as much as 10 to 15 percent of the unit.

Water and air move through the Tama soil at a moderate rate. The seasonal high water table is 4 to 6 feet below the surface during spring. Surface runoff is medium on the Tama soil and rapid on the Urban land. Available water capacity is very high in the Tama soil. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

The Tama soil is used for parks, building site development, lawns, or gardens. It is well suited to lawns, landscaping, and vegetable and flower gardens. It also is well suited to camping and picnic areas and to playgrounds. It is moderately suited to dwellings and septic tank absorption fields. It is poorly suited to local roads and streets.

If the Tama soil is used as a site for dwellings with basements, the seasonal water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations lowers the water table. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling.

Most homes and commercial buildings in areas of this unit are connected to a municipal sewer and waste-treatment facility. The seasonal high water table is a limitation if the Tama soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

Low strength and the potential for frost action are limitations if the Tama soil is used as a site for local roads and streets. Strengthening or replacing the base material and grading and land shaping help to remove excess water and prevent the damage caused by low strength and frost action.

This map unit is not assigned to a land capability classification.

2224D—Strawn-Urban land complex, 8 to 20 percent slopes. This map unit consists of a strongly sloping, well drained Strawn soil intermingled with areas of Urban land. It is on side slopes. Individual areas are polygonal, long and narrow, or irregularly shaped and range from 5 to 200 acres in size. They are about 45 to 55 percent Strawn soil and 30 to 40 percent Urban land. The Strawn soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Strawn soil is dark grayish brown, friable silt loam about 3 inches thick. The subsoil is about 18 inches thick. The upper part is dark brown, friable silty clay loam. The lower part is brown, friable clay loam. The underlying material to a depth of 60 inches or more is brown, calcareous, firm loam. In some areas, the subsoil is thicker and carbonates are below a depth of 40 inches. In other

areas the slope is more than 20 percent. In places the surface layer is darker.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure the soils that identification of the soil series is not possible.

Included in this map unit are small areas of the well drained Dorchester and Landes soils. These soils are subject to flooding and are in the lower drainageways. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Strawn soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid on the Strawn soil and the Urban land. Available water capacity is moderate in the Strawn soil. Organic matter content is moderately low. The shrink-swell potential and the potential for frost action are moderate.

The Strawn soil is used for parks, paths and trails, or lawns and gardens. It is poorly suited to lawns, gardens, trees, and shrubs and to nature paths and trails. It also is poorly suited to dwellings and septic tank absorption fields and to local roads and streets.

In areas where the Strawn soil is used for lawns, gardens, or trees and shrubs, competing vegetation is a management concern. It can be controlled by mulching and in some areas by chemicals.

If the Strawn soil is used as a site for dwellings, the slope is a limitation. Cutting and filling help to overcome this limitation.

Most homes and commercial buildings in areas of this unit are connected to a municipal sewer and waste-treatment facility. The moderately slow permeability and the slope are limitations if the Strawn soil is used as a site for septic tank absorption fields. Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the moderately slow permeability. Installing the filter lines on the contour or cutting and filling help to overcome the slope.

This map unit is not assigned to a land capability classification.

2279B—Rozetta-Urban land complex, 3 to 8 percent slopes. This map unit consists of a moderately sloping, moderately well drained Rozetta soil intermingled with areas of Urban land. It is on ridgetops and side slopes. Individual areas are polygonal or irregularly shaped and range from 5 to 2,000 acres in size. They are about 50 to 80 percent Rozetta soil and 15 to 45 percent Urban land. The Rozetta soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Rozetta soil is very dark grayish brown, friable silt loam about 5 inches thick. The subsurface layer is brown, friable silt loam about 5 inches thick. The subsoil is about 33 inches thick. It is friable. The upper part is yellowish brown silt loam. The lower part is dark yellowish brown, mottled silty clay loam. The underlying material to a depth of 60 inches is dark yellowish brown, mottled, friable silt loam. In some areas the seasonal high water table is at a depth of more than 6 feet. In other areas glacial till is within a depth of 60 inches. Some low areas have been filled, and some of the higher areas have been leveled during construction.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure the soils that identification of the soil series is not possible.

Included in this map unit are small areas of the somewhat poorly drained Keomah soils. These soils are in the less sloping, lower areas on broad ridges. They make up 5 to 10 percent of the unit.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is medium on the Rozetta soil and rapid on the Urban land. The seasonal high water table is 4 to 6 feet below the surface of the Rozetta soil during some parts of the year. Available water capacity is very high in this soil. Organic matter content is moderate. The shrink-swell potential also is moderate, and the potential for frost action is high.

The Rozetta soil is used for parks, building site development, lawns, or gardens. It is well suited to lawns, flower and vegetable gardens, and trees and shrubs. It is moderately suited to recreational uses and to dwellings and septic tank absorption fields.

If the Rozetta soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. The shrink-swell potential also is a limitation on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Most homes and commercial buildings in areas of this unit are connected to a municipal sewer and waste-treatment facility. The seasonal high water table is a limitation if the Rozetta soil is used as a site for septic tank absorption fields. Installing subsurface tile drains helps to lower the water table.

This map unit is not assigned to a land capability classification.

2290A—Warsaw-Urban land complex, 0 to 3 percent slopes. This map unit consists of a nearly level, well drained Warsaw soil intermingled with areas of Urban land. It is on flats on stream terraces. Individual areas are polygonal or irregularly shaped and range from 90 to 950 acres in size. They are about 40

to 55 percent Warsaw soil and 45 to 65 percent Urban land. The Warsaw soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Warsaw soil is black, very friable silt loam about 16 inches thick. The upper part is fill material. The subsurface layer is dark brown, friable loam about 4 inches thick. The subsoil is about 13 inches thick. The upper part is brown, firm clay loam. The lower part is dark brown, firm gravelly clay loam. The underlying material to a depth of 60 inches or more is brown, stratified, loose sand and very gravelly sand. In some areas the subsoil is thicker. In other areas as much as 3 feet of fill material is on the surface.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure the soils that the soil series cannot be identified.

Included in this map unit are small areas of the excessively drained Plainfield soils on the higher ridges and side slopes. These soils make up less than 10 percent of the unit.

Water and air move through the upper part of the Warsaw soil at a moderate rate and through the lower part at a very rapid rate. Surface runoff is slow on the Warsaw soil and rapid on the Urban land. Available water capacity is moderate in the Warsaw soil. Organic matter content also is moderate. The shrink-swell potential is low, and the potential for frost action is moderate.

The Warsaw soil is used for parks, building site development, lawns and gardens, or trees and shrubs. It is well suited to lawns, gardens, trees and shrubs, dwellings, and recreational uses. It is poorly suited to septic tank absorption fields.

Most homes and commercial buildings in areas of this unit are connected to a municipal sewer and waste-treatment facility. If the Warsaw soil is used as a site for septic tank absorption fields, a poor filtering capacity is a limitation. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. The septic tank system can function satisfactorily if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed.

This map unit is not assigned to a land capability classification.

2439B—Jasper, sandy substratum-Urban land complex, 1 to 7 percent slopes. This map unit consists of a gently sloping, well drained Jasper soil intermingled with areas of Urban land. It is on ridgetops and side slopes on stream terraces and outwash plains. Individual areas are polygonal or irregularly shaped and range from 150 to 1,500 acres in size. They are about 40 to 55 percent Jasper soil and 35 to 45 percent Urban land. The Jasper soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Jasper soil is black, friable loam about 10 inches thick. The subsurface layer is very dark grayish brown, friable loam about 6 inches thick. The subsoil is about 27 inches thick. The upper part is dark brown, friable loam; the next part is dark yellowish brown, friable sandy clay loam; and the lower part is dark brown, very friable sandy clay loam. The underlying material to a depth of 60 inches is dark brown, loose loamy sand. In some areas the upper part of the soil contains less clay. Small areas have been cut, built up, or smoothed.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure the soils that the soil series cannot be identified.

Included in this map unit are small areas of the excessively drained Plainfield soils on the higher ridges and side slopes. These soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Jasper soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is medium on the Jasper soil and rapid on the Urban land. Available water capacity is high in the Jasper soil. Organic matter content is moderate. The shrink-swell potential is low, and the potential for frost action is moderate.

The Jasper soil is used for parks, building site development, lawns, or gardens. It is well suited to lawns, vegetable and flower gardens, trees and shrubs, and recreational uses. It also is well suited to dwellings and septic tank absorption fields.

This map unit is not assigned to a land capability classification.

2802B—Orthents-Urban land complex, undulating. This map unit consists of moderately well drained or somewhat poorly drained, moderately fine textured to moderately coarse textured soils intermingled with Urban land. The soils have been cut, leveled, or filled during the construction of highways and urban structures. In most areas they are nearly level or gently sloping. In a few areas near interstate cloverleafs and roadbanks, however, they are moderately sloping or strongly sloping. Individual areas are polygonal or irregularly shaped and range from 3 to 1,000 acres in size. They are about 50 to 80 percent Orthents and 15 to 45 percent Urban land. The Orthents and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the surface layer of the Orthents is loam or

silt loam. The underlying material consists of layers of sandy loam, clay loam, loam, or silty clay loam. The soil material commonly is more than 5 feet thick. In cut areas the underlying material is loam glacial till or silt loam loess.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure the soils that the soil series cannot be identified.

Included in this map unit are a few undisturbed areas of Keomah, Rozetta, Hickory, Marseilles, and Strawn soils, generally near the edges of the unit. These soils make up less than 10 percent of the unit.

The rate at which water and air move through the Orthents varies because of the varying degree of compaction by construction equipment and because of the diverse soil material. Surface runoff is medium on the Orthents and rapid on the Urban land. Available water capacity varies in the Orthents but generally is moderately low. Organic matter content and natural fertility generally are low. The hazard of water erosion is severe in areas that are not protected by a plant cover.

Most of the acreage is idle land or is developed for residential, commercial, or other nonfarm uses. In severely eroded areas, special management is needed to establish and maintain the plant cover required to control water erosion. Newly exposed areas have no plant cover, whereas some developed areas have a good cover of sod. Onsite investigation is needed to determine the limitations or hazards affecting the development of specific areas for urban uses.

This map unit is not assigned to a land capability classification.

3070—Beaucoup silty clay loam, frequently flooded. This nearly level, poorly drained soil is on broad flats on flood plains along the major rivers and in depressions on stream terraces. It is frequently flooded for long periods from March through June and is subject to ponding. Individual areas are irregular in shape and range from 30 to 1,000 acres in size.

Typically, the surface layer is very dark gray, mottled, friable silty clay loam about 9 inches thick. The subsurface layer is very dark gray, mottled, friable silty clay loam about 13 inches thick. The subsoil to a depth of more than 60 inches is mottled, firm silty clay loam. The upper part is dark gray. The lower part is dark grayish brown. In some areas the subsoil contains more sand and is stratified. In other areas it contains more clay.

Included with this soil in mapping are small areas of the well drained Jules and excessively drained Sarpy soils. These soils are on slight rises above the Beaucoup soil. They make up 5 to 15 percent of the unit.

Water and air move through the Beaucoup soil at a moderately slow rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above the surface to 2.0 feet below during spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are used as woodland. Some areas support herbaceous wetland plants. This soil is well suited to habitat for wetland wildlife. It is moderately suited to woodland. It is generally unsuited to cultivated crops, pasture, and hay and to dwellings and septic tank absorption fields because of the flooding and the ponding.

If this soil is used as woodland, the equipment limitation, seedling mortality, and windthrow are management concerns. They are caused by the wetness. Plant competition also is a management concern. It hinders the growth of desirable seedlings. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting on ridges, by selecting nursery stock that is older and larger than is typical, or by mulching. Some replanting may be needed. Removing high-value trees only from a strip 50 feet wide along the west and south edges of the woodland and using harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Plant competition can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

This soil provides good habitat for wetland wildlife. The plant species that occur naturally furnish food and cover for wetland wildlife, such as ducks, muskrats, mink, and shore birds. The habitat should be protected from fire and grazing.

The land capability classification is Vw.

3406—Paxico silt loam, frequently flooded, long duration. This nearly level, somewhat poorly drained soil is on flats and slight rises on flood plains along the major rivers. It is frequently flooded for long periods from January through May. Individual areas are irregular in shape and range from 3 to 800 acres in size.

Typically, the surface layer is stratified dark gray, dark grayish brown, and brown, mottled, very friable, calcareous silt loam about 11 inches thick. The underlying material to a depth of 60 inches is stratified dark brown, brown, light brownish gray, and dark

grayish brown, mottled, calcareous, very friable silt loam. In some areas the surface layer is darker. In other areas a dark buried soil is within a depth of 40 inches.

Included with this soil in mapping are small areas of the excessively drained Sarpy soils. These soils are in the slightly higher areas above the Paxico soil. They make up 5 to 10 percent of the unit.

Water and air move through the Paxico soil at a moderate rate. Surface runoff is slow. The seasonal high water table is 1.5 to 3.0 feet below the surface during spring. Available water capacity is high. Organic matter content is moderately low. The shrink-swell potential is low, and the potential for frost action is high.

In most areas this soil is used as woodland. It is well suited to habitat for wetland and woodland wildlife. It is moderately suited to woodland. It generally is unsuited to cultivated crops, pasture, and hay and to dwellings and septic tank absorption fields because of the flooding.

If this soil is used as woodland, plant competition is a management concern. It hinders the growth of desirable seedlings. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

This soil provides good habitat for wetland wildlife. The plant species that occur naturally furnish food and cover for wetland wildlife, such as ducks, muskrats, mink, and shore birds. The habitat should be protected from fire and grazing.

The land capability classification is Vw.

7070—Beaucoup silty clay loam, rarely flooded. This nearly level, poorly drained soil is on broad flats on flood plains along the major rivers and in depressions on stream terraces. This soil is subject to rare flooding and to ponding. Individual areas are irregular in shape and range from 30 to 1,000 acres in size.

Typically, the surface layer is very dark gray, mottled, friable silty clay loam about 7 inches thick. The subsurface layer is very dark gray, mottled, friable silty clay loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled and friable. It is dominantly silty clay loam but has strata of silt loam in the lower part. The upper part is very dark gray. The next part is dark gray. The lower part is grayish brown. In some areas the subsoil contains more clay.

Included with this soil in mapping are small areas of the well drained Jules soils. These soils are on slight rises above the Beaucoup soil. They make up 5 to 10 percent of the unit.

Water and air move through the Beaucoup soil at a moderately slow rate. Surface runoff is slow to ponded. The seasonal high water table is 0.5 foot above the surface to 2.0 feet below during spring. Available water capacity is high. Organic matter content also is high. The shrink-swell potential is moderate, and the potential for frost action is high.

In most areas this soil is cultivated. It is well suited to cultivated crops. It is moderately suited to hay, pasture, and woodland. It generally is unsuitable as a site for dwellings and septic tank absorption fields because of the flooding and the ponding.

If drained, this soil can be used for corn, soybeans, or small grain. A drainage system has been installed in most areas. Measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water intake.

If this soil is used as woodland, the equipment limitation, seedling mortality, and windthrow are management concerns because of the wetness. Plant competition also is a management concern. It hinders the growth of desirable seedlings. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting on ridges, by selecting nursery stock that is older and larger than is typical, or by mulching. Some replanting may be needed. Removing high-value trees only from a strip 50 feet wide along the west and south edges of the woodland and using harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the windthrow hazard. Plant competition can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

The grain and seed crops, grasses and legumes, and wild herbaceous plants used as food and cover by openland wildlife grow well on this soil. Measures that protect the habitat from fire and grazing are needed. Some low areas in old oxbows and depressions are wet. Wetland plants and shallow water areas, which enhance wetland wildlife habitat, can be easily established in the oxbows and depressions.

The land capability classification is IIw.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban or built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

About 227,000 acres in Peoria County, or more than 56 percent of the total acreage, meets the requirements for prime farmland. The prime farmland is throughout the county. It generally is used for crops, mainly corn and soybeans, which account for most of the local agricultural income each year.

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in Peoria County that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some soils that have a seasonal high water table and all soils that are frequently flooded during the growing season qualify for prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. The need for these measures is indicated after the map unit name in table 5. Onsite evaluation is needed to determine whether or not these limitations or hazards have been overcome by corrective measures. Most of the naturally wet soils in Peoria County have been adequately drained.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help to prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

About 231,630 acres in Peoria County was cropland in 1982. This cropland included 129,995 acres of corn, 66,431 acres of soybeans, and 6,928 acres of wheat. An estimated 12,929 acres was pasture, and 9,690 acres was hayland *(16)*.

The chief management needs in the county are measures that control water erosion and soil blowing, that maintain or improve drainage in wet areas, that help to overcome the droughtiness of some soils, and that help to maintain tilth and fertility.

Water erosion is a major management concern in the county. On about 117,273 acres of cropland, erosion exceeds the tolerable limits established by the Soil Conservation Service. Tolerable soil loss is the maximum amount that soil can be eroded before economic production can no longer be sustained.

Loss of topsoil through sheet and rill erosion results in poor tilth and reduced productivity. As topsoil is lost, part of the subsoil, which is typically higher in content of clay, is incorporated into the plow layer and tilth deteriorates. As tilth deteriorates, the potential for cloddiness increases and the rate of water infiltration and the ease of preparing a seedbed decrease. A decreased rate of water infiltration is accompanied by an increased runoff rate and the potential for further water erosion. Nutrients valuable to crop production are lost as topsoil is lost.

Another damaging effect of water erosion is sedimentation of waterways, ditches, streams, and rivers. Controlling water erosion minimizes the detrimental effects of sedimentation, such as poor water quality, flooding that is associated with reduced channel

capacity, and the expensive removal of sediment.

Information about designing conservation practices is available from the Peoria County Soil and Water Conservation District.

Most of the nearly level soils in the county are susceptible to soil blowing. Soil blowing is especially serious in areas of sandy soils, such as Plainfield soils. Maintaining a plant cover or using a cropping system and a tillage system that leave the surface rough and covered with plant residue helps to control soil blowing. Windbreaks also are effective in controlling soil blowing.

Many of the soils in the county are artificially drained. Without artificial drainage, wetness can damage crops or delay planting or harvesting. About 7 percent of the soils in Peoria County are poorly drained or very poorly drained. Sawmill and Titus soils on flood plains and Drummer and Sable soils on uplands are examples. About 25 percent of the soils in the county are somewhat poorly drained. Lawson and Orion soils on flood plains and Ipava, Keomah, and Lisbon soils on uplands are examples.

The design of drainage systems differs from soil to soil. Tile drains function well in most soils on bottom land if suitable outlets are available. Standard tile lines do not function well, however, in the slowly permeable Titus soils. Surface ditches help to remove excess water in areas of these soils. Slowly permeable or very slowly permeable soils on uplands, such as Rushville and Denny soils, may require a drainage system other than standard tile lines. Surface ditches or a combination of scattered tile lines and surface inlets may be needed. Information about the drainage system suitable for each kind of soil is available in the local office of the Soil Conservation Service.

Droughtiness limits the productivity of Dickinson, Plainfield, and Sarpy soils. These soils are sandy or loamy and have a low available water capacity in the root zone. During periods of high water demand, an inadequate supply of soil moisture also is a problem in soils that have an unfavorable or root-restricting subsoil, such as Marseilles soils.

Natural fertility is high in Ipava, Sable, Lawson, and other soils that have a thick, dark surface layer. Plants respond well to applications of lime and fertilizer on these soils. Natural fertility is lower in Keomah, Rozetta, Rushville, and other soils that have a light colored surface layer. Generally, these soils are also more acid. Applying limestone helps to raise the pH to a level that is optimum for plant growth. Additions of lime, nitrogen, phosphorus, potassium, or other elements are needed for optimum yields. They should be based on the results of soil tests. The Cooperative Extension Service and the Soil Conservation Service can help in determining the kinds and amounts of fertilizer and lime needed.

Soil tilth is an important factor influencing the germination of seeds, the amount of runoff, and the rate of water intake. Good tilth is a condition in which the surface soil is granular and porous. A low organic matter content, a high content of clay, or a combination of these results in poor tilth. Poor tilth is a common problem in areas of the severely eroded Sylvan soils. A conservation tillage system improves tilth in these areas.

The climate and the soils in the county are particularly well suited not only to field crops but also to vegetables and specialty crops. Suitable field crops include many that are not commonly grown. The main crops are corn, soybeans, and wheat. Grain sorghum also is grown. Specialty crops, such as strawberries and sweet corn, are grown in some areas. Nursery stock is grown in a few areas. In addition, the county has several orchards.

Suitable pasture and hay plants include several legumes, cool-season grasses, and warm-season, native grasses. Alfalfa and red clover are the most common legumes grown for hay. They also are used in mixtures with grasses for hay and pasture.

Suitable warm-season, native grasses include big bluestem, little bluestem, indiangrass, and switchgrass. These grasses grow well in summer. They require different management techniques than cool-season grasses.

Alfalfa is best suited to deep, moderately well drained and well drained soils, such as Camden, Hickory, Rozetta, and Sylvan soils. The other legumes and grasses grow well on these soils and on the somewhat poorly drained soils in the uplands. Ipava and Keomah are examples of soils suited to most pasture and hay plants. Poorly drained and very poorly drained soils, such as Beaucoup, Drummer, Peotone, Rushville, Sable, and Sawmill soils, are suitable for water-tolerant plants.

Well managed forage stands are effective in controlling erosion. The need for lime and fertilizer and overgrazing are common management concerns. Additions of lime and fertilizer should be based on the results of soil tests, the needs of plants, and the expected level of yields.

Overgrazing reduces the vigor of pasture plants and forage production. It also results in an increase in the extent of weeds and brush. Timely deferment of grazing, rotation grazing, and proper stocking rates help to prevent overgrazing. Timely deferment of grazing and rotation grazing among several areas of pasture allow each pastured area a rest period. During this period the plants can build up reserves of carbohydrates. The information in table 6 can be helpful in estimating the number of animals that can be carried by a pasture.

Many of the soils in the county have a high water table in spring. Deferred grazing during wet periods minimizes surface compaction. Pasture renovation may be needed in compacted areas. Frost heave of alfalfa and red clover is a hazard on soils that have a high water table. A cover of stubble 4 to 6 inches high during winter and grass-legume mixtures can reduce the extent of the damage caused by frost heave.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents *(5)*. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops *(14)*. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations or hazards that restrict their use.

Class II soils have moderate limitations or hazards that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations or hazards that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations or hazards that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations or hazards that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations or hazards that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations or hazards that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Most of Peoria County was originally covered by hardwoods. In 1982, however, only about 25,000 acres was woodland *(16)*. Only a small part of this acreage is managed as commercial woodland. Christmas trees are grown in a few areas.

Much of the woodland is in areas of soils that are unsuitable for cultivation, commonly because they are too steep, are too wet, or are in isolated areas. Most of the woodland is in areas of associations 5, 8, 9, and 10, which are described in the section "General Soil Map Units."

The main tree species in the uplands are are black oak, white oak, red oak, and yellow poplar. Eastern cottonwood, sycamore, silver maple, and ash are dominant on bottom land.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excessive water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, high content of rock fragments in the soil; and *L*, low strength. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, and L.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, fire lanes, and log-handling areas. Forests that have been burned or overgrazed also are subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment or season of use is not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough to give adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet

and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class*. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It is the dominant species on the soil and the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

Peoria County has many parks and other recreational areas. The Peoria Park District provides recreational facilities, including golf courses, playgrounds, athletic fields, swimming pools, a botanical garden, picnic areas, and a zoo. Jubilee State Park, Wildlife Prairie Park, and Forest Park Nature Center provide opportunities for observing wildlife, hiking, horseback riding, and camping. The Illinois River is seasonally used for motorboating, fishing, and sailing.

The potential for further recreational development is good throughout the county. The soils having the best potential are in the uplands along the Illinois River and its major tributaries. These soils are in areas where a hilly terrain, wooded slopes, and numerous streams provide a variety of recreational opportunities.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to

heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, and wheatgrass.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwoods and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry.

Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian olive, autumn olive, and crabapple.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

In the following paragraphs, the associations described under the heading "General Soil Map Units" are grouped into three wildlife areas.

Wildlife area 1 consists of the Sable-Ipava, Ipava-Tama-Elkhart, Proctor-Elburn-Drummer, and Rozetta-Keomah-Sylvan associations. Most of this area is used for cultivated crops. Much of the area is fall plowed. Wildlife habitat can be improved by establishing or retaining a grassy or herbaceous cover, brushy areas, and hedgerows; by not mowing the grassy cover until after the nesting season; and by leaving crop residue on the surface after harvest.

Wildlife area 2 consists of the Hickory-Strawn-Marseilles and Lenzburg-Rapatee associations (fig. 9). It generally occurs as wooded areas that border bottom land. The Lenzburg-Rapatee association, however, is in surface-mined areas that in places are used as pasture or cropland. Wildlife habitat generally is good, especially in the areas of woodland. It can be improved by excluding livestock from wooded areas, by planting trees and shrubs that bear fruit and nuts in the wooded areas, by leaving crop residue on the surface after harvest, by establishing food plots of grain crops, and by not mowing the grassy cover until after the nesting season.

Wildlife area 3 consists of the Warsaw-Dickinson-Plainfield, Dorchester-Landes, Jules-Paxico-Lawson, and Beaucoup-Titus associations. It is on flood plains and terraces along the Illinois River and its tributaries. It is used as cropland, woodland, or pasture and is inhabited by openland, woodland, and wetland wildlife. Wildlife habitat is good or fair. Wetland wildlife habitat can be improved by establishing or preserving areas of open water; by increasing the capacity of ditches, pits, dikes, and levees to retain water; and by planting millet, buckwheat, sorghum, corn, and other crops that provide food for waterfowl.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed



Figure 9.—An idle area of Lenzburg silt loam, 20 to 60 percent slopes, stony. This area provides habitat for wildlife.

performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations. Estimates were made for erodibility, permeability, corrosivity, the shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreation uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems,

ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, the shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. The depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), the shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site

features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, and flooding affect absorption of the effluent. Large stones interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during the wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place

and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and the shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and depth to the water table is less than 1 foot. These soils may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or

site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability in the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control water erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 18.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates

determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated content of clay in each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to absorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change

of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentages of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.
8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in

table 17, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that is occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series

described in the section "Soil Series and Their Morphology." The soil samples were tested by the Illinois Department of Transportation.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); and Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(15)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquoll (*Aqu*, meaning water, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquolls (*Hapl*, meaning minimal horizonation, plus *aquoll*, the suborder of the Mollisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, mesic Typic Haplaquolls.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (13)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (15)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Alvin Series

The Alvin series consists of well drained soils on the sides of stream terraces and on side slopes in the uplands that border stream valleys. These soils are moderately permeable or moderately rapidly permeable

in the upper part and moderately rapidly permeable in the lower part. They formed in windblown or water-deposited loamy material. Slope ranges from 7 to 15 percent.

Typical pedon of Alvin fine sandy loam, 7 to 15 percent slopes, eroded, in an alfalfa pasture, 1,000 feet north and 2,000 feet west of the southeast corner of sec. 34, T. 9 N., R. 7 E.

Ap—0 to 7 inches; mixed brown (10YR 4/3) and dark yellowish brown (10YR 4/4) fine sandy loam, very pale brown (10YR 7/3) dry; weak very fine granular structure; very friable; many very fine and few fine roots; medium acid; clear smooth boundary.

EB—7 to 14 inches; mixed strong brown (7.5YR 5/6) and light brown (7.5YR 6/4) fine sandy loam; moderate medium platy structure parting to weak very fine subangular blocky; very friable; few very fine roots; strongly acid; clear smooth boundary.

Bt1—14 to 19 inches; brown (7.5YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct dark brown (7.5YR 4/4) clay films bridging sand grains; strongly acid; clear smooth boundary.

Bt2—19 to 26 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; friable; few very fine and fine roots; few distinct dark brown (7.5YR 4/4) clay films bridging sand grains; strongly acid; clear smooth boundary.

Bt3—26 to 34 inches; strong brown (7.5YR 5/6) loam; weak medium and coarse subangular blocky structure; friable; common very fine and fine roots; few distinct strong brown (7.5YR 4/6) clay films bridging sand grains; strongly acid; clear smooth boundary.

BC—34 to 47 inches; strong brown (7.5YR 5/6) fine sandy loam; very weak coarse subangular blocky structure; very friable; few very fine roots; few distinct strong brown (7.5YR 5/6) clay films bridging sand grains; strongly acid; clear smooth boundary.

C—47 to 60 inches; stratified brown (7.5YR 4/4) and dark yellowish brown (10YR 4/6) loamy fine sand and fine sand; single grained; loose; strongly acid.

The thickness of the solum ranges from 40 to 55 inches. The Ap horizon has chroma of 2 to 4. It is fine sandy loam or sandy loam. The Bt horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. It is dominantly fine sandy loam, loam, or sandy loam. In some pedons, however, it has thin layers of sandy clay loam or clay loam. The average content of clay in the control section ranges from 15 to 18 percent. The content of sand ranges from 45 to 70 percent. The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is stratified sandy loam, loamy sand, sand, or the fine analogs of those textures.

Assumption Series

The Assumption series consists of moderately well drained soils on shoulder slopes and side slopes in the uplands. Permeability is moderate in the upper part of the profile and moderately slow or slow in the lower part. These soils formed in loess and in the underlying loamy Illinoian drift, which has a strongly developed paleosol. Slope ranges from 5 to 15 percent.

The Assumption soils in this county have a thinner dark surface layer than is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical pedon of Assumption silt loam, 10 to 15 percent slopes, eroded, in a cultivated field, 500 feet north and 2,300 feet east of the southwest corner of sec. 4, T. 11 N., R. 6 E.

Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam mixed with yellowish brown (10YR 5/6) material; grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to weak very fine granular; friable; many very fine roots; neutral; clear smooth boundary.

BA—9 to 15 inches; yellowish brown (10YR 5/4) silt loam; moderate fine subangular blocky structure; friable; common very fine roots; very few distinct dark brown (10YR 3/3) organic coatings in pores; slightly acid; clear smooth boundary.

Bt1—15 to 24 inches; brown (10YR 4/3) silt loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

2Bt2—24 to 32 inches; brown (10YR 5/3) silty clay loam; few fine faint grayish brown (10YR 5/2) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

2Bt3—32 to 39 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate fine and medium prismatic structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; common medium soft accumulations of iron and manganese oxide; few till pebbles; slightly acid; clear smooth boundary.

2Bt4—39 to 49 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine prominent brownish yellow (10YR 6/6) and common fine distinct light yellowish brown (2.5Y 6/4) mottles; moderate fine and medium prismatic structure; firm; few very fine roots; common faint dark grayish brown (2.5Y 4/2) clay films on faces of peds and in pores; many medium concretions and stains of iron and manganese oxide; few pebbles; slightly acid; clear smooth boundary.

2Bt5—49 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent brownish yellow (10YR 6/6) and few fine distinct light yellowish brown (2.5Y 6/4) mottles; strong medium prismatic structure; firm; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; many medium soft accumulations of iron and manganese oxide; few pebbles; neutral.

The thickness of the solum ranges from 50 to more than 60 inches. The thickness of the loess ranges from 24 to 40 inches. The dark surface layer ranges from 4 to 9 inches in thickness.

The Ap horizon has value of 2 or 3 and chroma of 1 to 3. It is silt loam or silty clay loam. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. The 2Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 5, and chroma of 1 to 4.

Beaucoup Series

The Beaucoup series consists of poorly drained, moderately slowly permeable soils on broad flats on flood plains along the major rivers and in depressions on stream terraces. These soils formed in loamy alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Beaucoup silty clay loam, rarely flooded, in a cultivated field, 2,550 feet east and 1,805 feet south of the northwest corner of sec. 26, T. 7 N., R. 7 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine distinct yellowish brown (10YR 5/4) mottles; weak fine granular structure; friable; few very fine roots; few fine dark accumulations and concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

A—7 to 12 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine distinct brown (10YR 5/3) and yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure parting to weak fine granular; friable; few very fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

BA—12 to 17 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; many fine prominent strong brown (7.5YR 4/6) and few fine distinct brown (10YR 4/3) mottles; moderate fine subangular blocky structure; friable; few very fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; common fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg1—17 to 22 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg2—22 to 34 inches; dark gray (10YR 4/1) silty clay loam; many fine prominent yellowish brown (10YR 5/6) and common fine distinct brown (10YR 5/3) mottles; weak fine prismatic structure parting to weak fine subangular blocky; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg3—34 to 52 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine distinct yellowish brown (10YR 5/6) and common fine distinct brown (10YR 5/3) mottles; moderate fine and medium prismatic structure; friable; few very fine roots; common distinct dark gray (10YR 4/1) organic coatings on faces of peds; common fine accumulations of iron and manganese oxide; mildly alkaline; clear smooth boundary.

BCg—52 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam that has strata of silt loam; many fine distinct yellowish brown (10YR 5/6) and few fine prominent brownish yellow (10YR 6/6) mottles; weak medium prismatic structure; friable; few distinct dark gray (10YR 4/1) organic coatings on faces of peds; many fine accumulations of iron and manganese oxide; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 35 to 65 inches. The thickness of the mollic epipedon ranges from 10 to 24 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 to 6

and chroma of 0 to 2. In some pedons the lower part of this horizon has strata of silt loam, loam, or very fine sandy loam.

Brenton Series

The Brenton series consists of somewhat poorly drained, moderately permeable soils on slight rises on broad outwash plains and stream terraces. These soils formed in loess or silty sediments and in the underlying loamy outwash or alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Brenton silt loam, in a cultivated field, 290 feet west and 1,800 feet north of the southeast corner of sec. 10, T. 11 N., R. 7 E.

Ap—0 to 11 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

A—11 to 16 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine and medium subangular blocky structure; friable; few very fine roots; neutral; clear smooth boundary.

BA—16 to 22 inches; dark brown (10YR 4/3) silt loam; common fine faint grayish brown (10YR 5/2) and common fine faint yellowish brown (10YR 5/4) mottles; moderate fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few very fine roots; neutral; clear smooth boundary.

Bt1—22 to 29 inches; brown (10YR 5/3) silty clay loam; many fine faint light brownish gray (10YR 6/2) and common fine prominent yellowish brown (10YR 5/8) mottles; moderate fine subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few and common fine soft dark accumulations of iron and manganese oxide; few very fine roots; neutral; clear smooth boundary.

2Bt2—29 to 38 inches; yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6), stratified silt loam, loam, and silty clay loam; common fine distinct light brownish gray (10YR 6/2) mottles; moderate fine subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine soft dark accumulations of iron and manganese oxide; few very fine roots; neutral; clear smooth boundary.

2BC—38 to 52 inches; brownish yellow (10YR 6/6), stratified silt loam and loam; common fine faint yellow (10YR 7/6) and many fine faint brownish yellow (10YR 6/4) mottles; weak fine subangular blocky structure; friable; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine soft dark accumulations of iron and manganese oxide; few very fine roots; mildly alkaline; clear smooth boundary.

2C—52 to 60 inches; brownish yellow (10YR 6/6) and yellow 10YR 7/6), stratified silt loam and loam; common fine distinct yellow (10YR 7/8) mottles; massive; friable; mildly alkaline.

The thickness of the solum ranges from 38 to 60 inches. The thickness of the silty material ranges from 25 to 40 inches. The mollic epipedon is 10 to 22 inches thick.

The Ap and A horizons have chroma of 1 or 2. The Bt horizon has value of 4 to 6 and chroma of 2 to 4. The 2Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 8. In some pedons it is not stratified. The 2C horizon has hue of 10YR or 7.5YR, value 5 to 7, and chroma of 4 to 8. It is stratified silt loam, loam, or sandy loam.

Camden Series

The Camden series consists of well drained soils on the sides of stream terraces and on the sides of ridges on outwash plains. These soils are moderately permeable in the upper part and moderately permeable or moderately rapidly permeable in the lower part. They formed in loess and in the underlying loamy and sandy outwash. Slope ranges from 2 to 18 percent.

Typical pedon of Camden silt loam, 2 to 5 percent slopes, in a cultivated field, 30 feet east and 1,540 feet north of the southwest corner of sec. 7, T. 11 N., R. 5 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; common brown (10YR 5/3) fragments of a former E horizon in the lower part; weak very fine and fine subangular blocky structure and some weak thin platy structure in the lower part; friable; few very fine roots; medium acid; abrupt smooth boundary.

Bt1—8 to 14 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; few fine concretions of iron and manganese oxide; medium acid; clear smooth boundary.

Bt2—14 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; few prominent brown (10YR 4/3) clay films and few distinct very pale brown (10YR 7/3 dry) silt coatings on faces of peds; few fine concretions of iron and manganese oxide; strongly acid; gradual smooth boundary.

Bt3—23 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine roots; few prominent brown (10YR 4/3) clay films and few distinct very pale brown (10YR 7/3 dry) silt coatings on faces of peds; few fine concretions of iron and manganese oxide; strongly acid; abrupt smooth boundary.

2Bt4—34 to 43 inches; yellowish brown (10YR 5/4) sandy clay loam; weak coarse subangular blocky structure; friable; few faint brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

2C—43 to 60 inches; stratified brown (10YR 4/3) and yellowish brown (10YR 5/4) sandy loam, loam, and loamy sand; few fine distinct light yellowish brown (2.5Y 6/4) mottles; massive; friable; medium acid.

The thickness of the solum ranges from 43 to more than 60 inches. The thickness of the loess ranges from 24 to 40 inches.

The Ap or A horizon has value of 4 or 5 and chroma of 2 or 3. Some pedons have an E horizon. The Bt and 2Bt horizons have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. The 2Bt horizon is sandy clay loam, clay loam, or sandy loam. The content of clay ranges from 27 to 35 percent in the control section. The 2C horizon has value of 4 or 5 and chroma of 3 or 4. It is stratified sandy loam, loam, loamy sand, or silt loam.

Catlin Series

The Catlin series consists of moderately well drained, moderately permeable soils on side slopes on till plains. These soils formed in loess and in the underlying loamy glacial till. Slope ranges from 2 to 10 percent.

Typical pedon of Catlin silt loam, 2 to 5 percent slopes, eroded, in a cultivated field, 1,900 feet west and 1,140 feet south of the northeast corner of sec. 25, T. 11 N., R. 7 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; few streaks of dark brown (10YR 4/3) subsoil material; weak very fine and fine granular structure; friable; many very fine and fine and few medium roots; slightly acid; clear smooth boundary.

Bt1—10 to 13 inches; dark brown (10YR 4/3) silty clay loam; weak fine and moderate very fine subangular blocky structure; friable; common very fine and fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings and common distinct dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—13 to 18 inches; dark brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common very fine and fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores and many faint dark brown (10YR 3/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt3—18 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine prominent grayish brown (2.5Y 5/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; common very fine and few fine roots; many faint dark brown (10YR 4/3) clay films on faces of peds; few fine dark soft accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt4—28 to 43 inches; dark yellowish brown (10YR 4/4) silt loam; common fine prominent grayish brown (2.5Y 5/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine and few fine roots; very few distinct dark brown (7.5YR 3/2) and common faint dark brown (7.5YR 3/4) clay films on faces of peds; common fine and medium dark soft accumulations of iron and manganese oxide; few till pebbles; neutral; clear smooth boundary.

2BC—43 to 51 inches; brown (7.5YR 5/4) loam; weak coarse subangular blocky structure; firm; few very fine roots; very few prominent dark brown (7.5YR 3/2) clay films on faces of peds in the upper part; few fine dark soft accumulations of iron and manganese oxide; common pebbles; strong effervescence; moderately alkaline; gradual smooth boundary.

2C—51 to 60 inches; brown (7.5YR 5/4) loam; appears massive but has cleavage planes; firm; few fine and medium dark soft accumulations of iron and manganese oxide; common pebbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 45 to more than 60 inches. The Ap or A horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon has value of 4 or 5. The 2Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The 2C horizon, if it occurs, has hue of 10YR or 7.5YR.

Catlin silt loam, 5 to 10 percent slopes, eroded, has a thinner dark surface soil than is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Chute Series

The Chute series consists of excessively drained, rapidly permeable soils on side slopes in the uplands that border major stream valleys. These soils formed in windblown sandy material. Slope ranges from 18 to 35 percent.

Typical pedon of Chute loamy fine sand, 18 to 35 percent slopes, in a wooded area, 300 feet east and 1,400 feet south of the northwest corner of sec. 28, T. 9 N., R. 7 E.

A—0 to 4 inches; mixed dark brown (10YR 3/3) and brown (10YR 4/3) loamy fine sand, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; few very fine roots; mildly alkaline; clear wavy boundary.

AC—4 to 11 inches; dark yellowish brown (10YR 4/4) fine sand; weak medium subangular blocky structure; very friable; few very fine roots; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; slight effervescence; mildly alkaline; clear smooth boundary.

C—11 to 60 inches; yellowish brown (10YR 5/6) fine sand; single grained; loose; strong effervescence; moderately alkaline.

The solum is less than 15 inches thick. The A horizon has value of 3 to 5 and chroma of 2 or 3. It is loamy fine sand or fine sand. The C horizon has value of 5 or 6 and chroma of 3 to 6. It is fine sand, sand with a high content of fine sand, or loamy fine sand.

Clarksdale Series

The Clarksdale series consists of somewhat poorly drained, moderately slowly permeable soils on broad ridgetops in the uplands and on stream terraces. These soils formed in loess. Slope ranges from 0 to 2 percent.

Typical pedon of Clarksdale silt loam, in a cultivated field, 2,100 feet west and 800 feet north of the southeast corner of sec. 3, T. 8 N., R. 5 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; few dark grayish brown (10YR 4/2) soil fragments from the E horizon; moderate medium granular and weak medium platy structure; friable; many very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; neutral; abrupt smooth boundary.

E—8 to 13 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium platy and moderate fine subangular blocky structure; friable; many very fine and fine roots; few fine concretions of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt1—13 to 17 inches; brown (10YR 5/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and prominent light brownish gray (2.5Y 6/2) mottles; moderate very fine and fine subangular blocky structure; friable; many very fine roots; few distinct dark gray (10YR 4/1) and very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine bright stains and concretions of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—17 to 30 inches; brown (10YR 5/3) silty clay loam; common fine distinct light brownish gray (2.5Y 6/2) and common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; friable; few fine roots; common distinct dark gray (10YR 4/1) and dark grayish brown (10YR 4/2) clay films on faces of peds and few faint very dark gray (10YR 3/1) organic coatings in pores; few fine concretions of iron and manganese oxide; medium acid; clear smooth boundary.

Btg—30 to 40 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine distinct light olive brown (2.5Y 5/4) and many fine prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; friable; few faint dark gray (10YR 4/1) and dark grayish brown (10YR 4/2) clay films on faces of peds and in pores; few fine concretions of iron and manganese oxide; mildly alkaline; gradual smooth boundary.

BCg—40 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common fine distinct light olive brown (2.5Y 5/6) mottles; massive weak coarse subangular blocky structure; friable; few faint dark gray (10YR 4/1) clay films in pores; common fine concretions of iron and manganese oxide and common white soft accumulations of calcium carbonate; moderately alkaline.

The thickness of the solum ranges from 40 to more than 60 inches. The depth to carbonates is more than 40 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 to 6 and chroma of 1 or 2. The Bt horizon has value of 4 to 6 and chroma of 1 to 3. It is silty clay loam or silty clay. The content of clay ranges from 35 to 42 percent in the control section. Some pedons have a Cg horizon within a depth of 60 inches. This horizon is silt loam. It has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 to 6.

Denny Series

The Denny series consists of poorly drained soils in closed depressions in the uplands. These soils are moderately slowly permeable in the upper part and slowly permeable or moderately slowly permeable in the lower part. They formed in loess. Slope ranges from 0 to 2 percent.

Typical pedon of Denny silt loam, in a cultivated field, 2,400 feet south and 1,925 feet west of the northeast corner of sec. 31, T. 10 N., R. 5 E.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure in the upper part and weak thin platy structure in the lower part; very friable; common very fine roots; neutral; abrupt smooth boundary.

Eg1—9 to 16 inches; dark gray (10YR 4/1) silt loam; moderate medium platy structure; very friable; common very fine roots; slightly acid; abrupt smooth boundary.

Eg2—16 to 21 inches; light brownish gray (10YR 6/2) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate thin platy structure; very friable; common very fine roots; few prominent black (10YR 2/1) organic coatings on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg1—21 to 33 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common very fine roots; common prominent black (10YR 2/1) organic coatings and many prominent dark brown (10YR 3/3) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg2—33 to 40 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; common prominent black (N 2/0) organic coatings and dark brown (10YR 3/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg3—40 to 47 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium prominent yellowish brown (10YR 5/8) and many medium prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm; few very fine roots; few prominent black (N 2/0) organic coatings and common prominent dark brown (10YR 3/3) clay films on faces of peds; many medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Cg—47 to 60 inches; light gray (2.5Y 6/2) silt loam; many medium prominent yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) mottles; massive; friable; few very fine roots; slightly acid.

The thickness of the solum ranges from 40 to 60 inches. The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. It is silty clay loam or silty clay. The content of clay ranges from 35 to 40 percent in the control section. The Cg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2.

Dickinson Series

The Dickinson series consists of well drained soils on stream terraces and on ridgetops and side slopes on outwash plains. These soils are moderately rapidly permeable in the upper part and rapidly permeable in the lower part. They formed in loamy and sandy outwash or alluvium. Slope ranges from 1 to 4 percent.

Typical pedon of Dickinson sandy loam, 1 to 4 percent slopes, in a grass pasture, 900 feet west and 1,550 feet south of the northeast corner of sec. 3, T. 10 N., R. 8 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; common very fine and fine roots; slightly acid; abrupt smooth boundary.

A—9 to 15 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; moderate very fine granular and subangular blocky structure; friable; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; few very fine roots; medium acid; abrupt smooth boundary.

Bw1—15 to 24 inches; brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable; few faint dark brown (10YR 3/3) organic coatings on faces of peds; few very fine roots; medium acid; clear smooth boundary.

Bw2—24 to 31 inches; brown (7.5YR 4/4) loamy sand; weak fine subangular blocky structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

BC—31 to 39 inches; brown (7.5YR 4/4) sand; weak fine subangular blocky structure; very friable; few

very fine roots; neutral; clear smooth boundary.
C—39 to 60 inches; brown (7.5YR 4/4) sand; single grained; loose; neutral.

The thickness of the solum ranges from 25 to 50 inches. The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. They are fine sandy loam, sandy loam, or loam. The Bw horizon has value of 3 to 5 and chroma 2 to 4. It is fine sandy loam or sandy loam in the upper part and loamy sand or sand in the lower part. The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is loamy fine sand, loamy sand, fine sand, or sand.

Dodge Series

The Dodge series consists of well drained, moderately permeable soils on shoulder slopes and side slopes in the uplands. These soils formed in loess and in the underlying loamy glacial till. Slope ranges from 5 to 18 percent.

Typical pedon of Dodge silt loam, 10 to 18 percent slopes, in a wooded area, 1,150 feet west and 2,300 feet south of the northeast corner of sec. 5, T. 10 N., R. 8 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; common very fine and fine roots; neutral; abrupt smooth boundary.
E—3 to 7 inches; brown (10YR 5/3) silt loam; moderate thin platy structure; friable; common very fine and fine roots; few dark grayish brown (10YR 4/2) organic coatings on faces of peds; medium acid; clear smooth boundary.
EB—7 to 12 inches; yellowish brown (10YR 5/4) silt loam; weak medium platy structure parting to moderate very fine subangular blocky; friable; few very fine, fine, and coarse roots; common faint pale brown (10YR 6/3 dry) silt coatings on faces of peds; medium acid; clear smooth boundary.
Bt1—12 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few very fine and fine roots; few distinct dark brown (7.5YR 4/4) clay films on faces of peds; few distinct pale brown (10YR 6/3) silt coatings on faces of peds; medium acid; clear smooth boundary.
Bt2—18 to 27 inches; yellowish brown (10YR 5/6) silty clay loam; moderate and strong medium subangular blocky structure; firm; few very fine and fine roots; common dark brown (7.5YR 4/4) clay films on faces of peds and in pores and few prominent dark grayish brown (10YR 4/2) organic coatings on faces of peds; common fine soft accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.
2Bt3—27 to 32 inches; dark brown (7.5YR 4/4) clay loam; strong medium subangular blocky structure; very firm; few very fine and fine roots; many distinct dark brown (10YR 3/3) clay films on faces of peds and few prominent very dark grayish brown (10YR 3/2) organic coatings in pores; common fine soft accumulations of iron and manganese oxide; common pebbles; very slight effervescence below a depth of 30 inches; neutral; abrupt smooth boundary.
2C—32 to 60 inches; yellowish brown (10YR 5/4) loam; massive; very firm; common pebbles; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 30 to 40 inches. The A or Ap horizon has value of 3 to 5 and chroma of 2 to 4. The E horizon has value of 4 or 5 and chroma of 2 to 4. The Bt horizon has value of 4 or 5 and chroma of 4 to 6. It is silty clay loam or silt loam. The 2Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. The 2C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6.

Dorchester Series

The Dorchester series consists of well drained, moderately permeable soils on slight rises on flood plains and in upland drainageways. These soils formed in calcareous, silty alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Dorchester silt loam, in a cultivated field, 1,600 feet east and 1,650 feet south of the northwest corner of sec. 36, T. 10 N., R. 6 E.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 6/1) dry; weak medium platy structure parting to weak very fine subangular blocky; friable; few very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slight effervescence; mildly alkaline; abrupt smooth boundary.
C—9 to 32 inches; stratified dark grayish brown (10YR 4/2), brown (10YR 5/3), very dark gray (10YR 3/1), and very dark grayish brown (10YR 3/2) silt loam; few thin strata of loam; massive with moderate thin bedding planes because of stratification; friable; few very fine roots; slight effervescence; mildly alkaline; abrupt smooth boundary.
2Ab1—32 to 43 inches; black (10YR 2/1) silt loam;

weak fine subangular blocky structure parting to weak very fine granular; friable; mildly alkaline; gradual smooth boundary.

2Ab2—43 to 60 inches; very dark gray (10YR 3/1) silt loam; few fine distinct brown (10YR 4/3) mottles below a depth of 48 inches; moderate fine subangular blocky structure; friable; many faint black (10YR 2/1) organic coatings on faces of peds; mildly alkaline.

The thickness of the solum is less than 10 inches and corresponds to the thickness of the A or Ap horizon. Depth to the 2Ab horizon ranges from 20 to 45 inches.

The Ap horizon has value of 3 or 4 and chroma of 2 or 3. The C horizon is dominantly silt loam but has thin strata of coarser textured material. The 2Ab horizon has chroma of 1 or 2. It is silt loam, silty clay loam, or clay loam.

Downs Series

The Downs series consists of moderately well drained, moderately permeable soils on ridgetops and side slopes in the uplands and on stream terraces. These soils formed in loess. Slope ranges from 1 to 5 percent.

Typical pedon of Downs silt loam, 1 to 5 percent slopes, in a cultivated field, 165 feet south and 55 feet west of the center of sec. 8, T. 11 N., R. 8 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; dark grayish brown (10YR 4/3) streaks; weak very fine and fine granular structure; friable; many very fine roots; common distinct light gray (10YR 7/1 dry) silt coatings on faces of peds; medium acid; abrupt smooth boundary.

Bt1—9 to 12 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; friable; common very fine roots; many distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; common faint light gray (10YR 7/1 dry) silt coatings on faces of peds; medium acid; clear smooth boundary.

Bt2—12 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; common very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt3—16 to 22 inches; yellowish brown (10YR 5/4) silty clay loam; strong fine subangular blocky structure; firm; common very fine and few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

Bt4—22 to 33 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; common very fine and few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt5—33 to 44 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct light brownish gray (10YR 6/2) and common fine faint yellowish brown (10YR 5/6 and 5/8) mottles; weak fine prismatic structure parting to weak medium subangular blocky; friable; few very fine roots; few faint brown (10YR 5/3) and few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

BC—44 to 60 inches; light yellowish brown (10YR 6/4) silt loam; common fine distinct yellowish brown (10YR 5/6 and 5/8) and light brownish gray (10YR 6/2) mottles; weak medium prismatic structure; friable; few very fine roots; few fine and medium soft accumulations of iron and manganese oxide; neutral.

The thickness of the solum ranges from 50 to more than 60 inches. The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has chroma of 3 to 6.

Drummer Series

The Drummer series consists of poorly drained, moderately permeable soils on broad flats and in depressions and shallow drainageways on outwash plains. These soils formed in loess or silty sediments and in the underlying outwash. Slope ranges from 0 to 2 percent.

Typical pedon of Drummer silty clay loam, in a cultivated field, 100 feet south and 1,100 feet west of the northeast corner of sec. 17, T. 11 N., R. 7 E.

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; common fine and very fine roots; neutral; clear smooth boundary.

A—7 to 17 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to weak fine granular; friable; common very fine and few fine roots; few

fine dark soft accumulations and concretions of iron and manganese oxide; neutral; clear smooth boundary.

AB—17 to 22 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; common fine distinct grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) mottles; weak medium prismatic structure parting to moderate fine subangular blocky; friable; common very fine and few fine roots; few faint dark gray (10YR 4/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; few pebbles; neutral; clear smooth boundary.

Btg1—22 to 36 inches; mottled light yellowish brown (2.5Y 6/4), dark gray (N 4/0), and grayish brown (10YR 5/2) silty clay loam; moderate fine and medium prismatic structure parting to moderate medium subangular blocky; friable; few fine and common very fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common fine concretions of iron and manganese oxide; few pebbles; mildly alkaline; clear smooth boundary.

Btg2—36 to 46 inches; grayish brown (10YR 5/2) silty clay loam; common fine prominent strong brown (7.5YR 5/8) mottles; weak fine prismatic structure parting to weak medium subangular blocky; friable; common very fine and few fine roots; few distinct very dark gray (10YR 3/1) organic coatings and few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine and medium concretions and common medium soft accumulations of iron and manganese oxide; few pebbles; mildly alkaline; abrupt smooth boundary.

2BCg—46 to 54 inches; dark grayish brown (10YR 4/2) loam that has strata of brownish yellow (10YR 6/6) sandy loam; common fine distinct brownish yellow (10YR 6/8) mottles; very weak medium subangular blocky structure; friable; few fine dark gray (N 4/0) coatings on faces of peds; few fine concretions and common fine and medium soft accumulations of iron and manganese oxide; few pebbles; mildly alkaline; clear smooth boundary.

2Cg—54 to 60 inches; grayish brown (2.5Y 5/2), stratified sandy loam and loamy sand; common fine distinct dark gray (5Y 4/1) mottles; massive; friable; common medium soft accumulations of iron and manganese oxide; few pebbles; mildly alkaline.

The thickness of the solum ranges from 48 to more than 60 inches. The Ap and A horizons have value of 2 or 3. The Btg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 4. The 2BCg and 2Cg horizons have hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 to 6. They are stratified loamy sand, sandy loam, loam, clay loam, silt loam, or silty clay loam.

Elburn Series

The Elburn series consists of somewhat poorly drained soils on slight rises on outwash plains and stream terraces. These soils are moderately permeable in the upper part and moderately permeable or moderately rapidly permeable in the lower part. They formed in loess or silty sediments and in the underlying loamy outwash. Slope ranges from 0 to 2 percent.

Typical pedon of Elburn silt loam, in a cultivated field, 2,450 feet west and 2,100 feet south of the northeast corner of sec. 3, T. 11 N., R. 6 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few soft accumulations of iron and manganese oxide; neutral; clear smooth boundary.

A—10 to 18 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular and moderate very fine subangular blocky structure; friable; common very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few soft accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt1—18 to 23 inches; brown (10YR 4/3) silty clay loam; many fine distinct light brownish gray (2.5Y 6/2) and common medium distinct yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; many distinct very dark gray (10YR 3/1) organic coatings and few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common soft accumulations and common concretions of iron and manganese oxide; slightly acid; gradual smooth boundary.

Bt2—23 to 34 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) and many fine distinct brown (10YR 5/3) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; many distinct dark gray (10YR 4/1) and common distinct very dark gray (10YR 3/1) clay films on faces of peds; common soft accumulations and common concretions of iron and manganese oxide; slightly acid; gradual smooth boundary.

Bt3—34 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine faint light brownish gray (2.5Y

6/2) and common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds and few distinct very dark gray (10YR 3/1) organic coatings in pores; common soft accumulations and common concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt4—41 to 50 inches; grayish brown (10YR 5/2) silty clay loam; common fine faint light brownish gray (10YR 6/2) and common medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; friable; few very fine roots; few faint dark gray (10YR 4/1) clay films on faces of peds and in pores and few faint very dark gray (10YR 3/1) organic coatings in pores; common soft accumulations and common concretions of iron and manganese oxide; neutral; abrupt smooth boundary.

2Bt5—50 to 60 inches; light brownish gray (2.5Y 6/2) loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few faint dark gray (10YR 4/1) clay films on faces of peds and in pores and few faint very dark gray (10YR 3/1) organic coatings in pores; common soft accumulations and common concretions of iron and manganese oxide; neutral.

The thickness of the solum ranges from 45 to 70 inches. The thickness of the loess ranges from 45 to 60 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. Some pedons have a BA or AB horizon. The Bt horizon has chroma of 2 to 4 and has mottles with chroma of 2 to 8. The 2Bt horizon has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 2 to 4. Some pedons have a 2BC or 2C horizon within a depth of 60 inches.

Elco Series

The Elco series consists of moderately well drained soils on shoulder slopes and side slopes in the uplands. These soils are moderately permeable in the upper part and moderately slowly permeable or slowly permeable in the lower part. They formed in loess and in the underlying loamy or clayey Illinoian drift, which has a strongly developed paleosol. Slope ranges from 8 to 20 percent.

Typical pedon of Elco silt loam, 15 to 20 percent slopes, in a pasture, 2,180 feet west and 2,400 feet north of the southeast corner of sec. 9, T. 8 N., R. 7 E.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many very fine roots; medium acid; clear smooth boundary.

E—6 to 9 inches; brown (10YR 5/3) silt loam; few fine faint yellowish brown (10YR 5/4) mottles; weak medium platy structure parting to moderate fine granular; friable; common very fine roots; common distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

BE—9 to 12 inches; yellowish brown (10YR 5/4) silt loam; moderate very fine subangular blocky structure; friable; common very fine roots; few faint brown (10YR 4/3) clay films and few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; few fine soft accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt1—12 to 22 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—22 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; common fine prominent light brownish gray (2.5Y 6/2) mottles in the lower 2 inches; moderate fine subangular blocky structure; firm; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; few pebbles; strongly acid; clear smooth boundary.

2Bt3—27 to 35 inches; brown (10YR 5/3) silty clay loam; many fine prominent light brownish gray (2.5Y 6/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine and medium soft accumulations of iron and manganese oxide; common pebbles; strongly acid; gradual smooth boundary.

2Bt4—35 to 53 inches; brown (10YR 5/3) silty clay loam; many fine prominent light gray (5Y 6/1) and many fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to weak coarse subangular blocky; firm; few very fine roots; few prominent dark grayish brown (2.5Y 4/2) and common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine and medium soft accumulations of iron and manganese oxide; common pebbles; slightly acid; clear smooth boundary.

2Bt5—53 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine distinct light gray (5Y 6/1) and common fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; few very fine roots; few fine gray (5Y 5/1) and common fine grayish brown (2.5Y 5/2) clay films on faces of peds; few fine and medium soft accumulations of iron and manganese oxide; common till pebbles; neutral.

The thickness of the solum ranges from 50 to more than 60 inches. The thickness of the loess ranges from 20 to 40 inches.

The Ap horizon has value of 3 or 4 and chroma of 1 or 2. Some pedons do not have an E horizon. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. The 2Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 6, and chroma of 1 to 4. It is loam, silty clay loam, or silty clay.

Elkhart Series

The Elkhart series consists of moderately well drained, moderately permeable soils on side slopes in the uplands. These soils formed in loess. Slope ranges from 2 to 10 percent.

The Elkhart soils in this county have a thinner dark surface layer than is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical pedon of Elkhart silty clay loam, 5 to 10 percent slopes, eroded, in a cultivated field, 2,585 feet north and 225 feet west of the southeast corner of sec. 15, T. 10 N., R. 5 E.

Ap—0 to 8 inches; mixed very dark grayish brown (10YR 3/2) and brown (10YR 4/3) silty clay loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine roots; slightly acid; abrupt smooth boundary.

Bt1—8 to 13 inches; brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings and clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—13 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and very fine subangular blocky structure; firm; common very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; clear smooth boundary.

Bt3—21 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to moderate medium angular and subangular blocky; firm; common very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; clear smooth boundary.

BC—32 to 39 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct grayish brown (10YR 5/2) and common fine prominent strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; friable; few very fine roots; few fine soft accumulations of iron and manganese oxide; very slight effervescence; moderately alkaline; clear smooth boundary.

C—39 to 60 inches; brown (10YR 5/3) silt loam; common medium prominent yellowish red (5YR 4/6), common medium prominent strong brown (7.5YR 5/6), and common fine faint light brownish gray (10YR 6/2) mottles; massive; friable; few very fine roots; few fine soft accumulations of iron and manganese oxide; slight effervescence; moderately alkaline.

The thickness of the solum and the depth to carbonates range from 20 to 40 inches. The dark surface layer ranges from 5 to 9 inches in thickness.

The Ap horizon has value of 2 to 4 and chroma of 1 to 3. It is silty clay loam or silt loam. The Bt horizon has hue of 7.5YR or 10YR and chroma of 4 to 6.

Fayette Series

The Fayette series consists of well drained, moderately permeable soils on side slopes in the uplands. These soils formed in loess. Slope ranges from 5 to 30 percent.

Typical pedon of Fayette silt loam, 15 to 30 percent slopes, in a wooded area, 480 feet west and 2,360 feet south of the northeast corner of sec. 2, T. 8 N., R. 7 E.

A—0 to 3 inches; mixed very dark gray (10YR 3/1) and dark grayish brown (10YR 4/2) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; common very fine roots; medium acid; clear smooth boundary.

E—3 to 9 inches; yellowish brown (10YR 5/4) silt loam; moderate medium platy structure parting to moderate fine granular; very friable; common very fine roots; few fine soft accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

BE—9 to 15 inches; yellowish brown (10YR 5/4) silt loam; moderate very fine and fine subangular blocky structure; friable; common very fine roots; few prominent light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine soft accumulations of iron

and manganese oxide; very strongly acid; clear smooth boundary.

Bt1—15 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; strong fine and medium subangular blocky structure; firm; few very fine roots; many distinct dark yellowish brown (10YR 4/4) clay films and few prominent light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine soft accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt2—27 to 37 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films and few prominent light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine soft accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

BC—37 to 52 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint dark yellowish brown (10YR 4/4) and many fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few fine roots; few prominent light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine soft accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

C—52 to 60 inches; yellowish brown (10YR 5/4) silt loam; common fine faint yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; appears massive but has some vertical cleavage planes; firm; few fine roots; strongly acid.

The thickness of the solum ranges from 36 to 60 inches. The depth to carbonates is more than 40 inches.

The A or Ap horizon has value of 2 to 4 and chroma of 1 to 3. The E horizon has value of 4 or 5 and chroma of 1 to 4. Some eroded pedons do not have an E horizon. The Bt horizon has value of 4 or 5 and chroma of 3 or 4.

Harpster Series

The Harpster series consists of poorly drained, moderately permeable, calcareous soils in slight depressions on till plains and outwash plains. These soils formed in silty material. Slope ranges from 0 to 2 percent.

Typical pedon of Harpster silty clay loam, in a cultivated field, 150 feet north and 1,860 feet east of the southwest corner of sec. 24, T. 11 N., R. 7 E.

Akp—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common very fine roots; common snail shells and fragments of shells; violent effervescence; moderately alkaline; abrupt smooth boundary.

Ak1—8 to 12 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; common fine faint dark grayish brown (10YR 4/2) mottles; moderate fine and medium granular structure; friable; common very fine roots; common snail shells and fragments of shells; violent effervescence; moderately alkaline; clear smooth boundary.

Ak2—12 to 16 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; many fine distinct dark grayish brown (2.5Y 4/2) mottles; moderate medium granular structure; firm; common very fine roots; common snail shells and fragments of shells; strong effervescence; mildly alkaline; clear smooth boundary.

Bg1—16 to 20 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; many fine distinct yellowish brown (10YR 5/4) mottles; moderate very fine and fine angular blocky structure; firm; common very fine roots; common snail shells and fragments of shells; slight effervescence; moderately alkaline; clear smooth boundary.

Bg2—20 to 37 inches; gray (5Y 5/1) silty clay loam; many fine prominent yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium prismatic structure parting to weak medium angular blocky; firm; common very fine roots; few snail shells and fragments of shells; few pebbles; slight effervescence; mildly alkaline; gradual smooth boundary.

Bg3—37 to 45 inches; gray (5Y 5/1) silty clay loam; many fine prominent light olive brown (2.5Y 5/4) and common fine prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure; firm; few very fine roots; few snail shells and fragments of shells; few pebbles; slight effervescence; mildly alkaline; gradual smooth boundary.

Cg—45 to 60 inches; gray (5Y 5/1) silt loam; many fine distinct olive (5Y 5/3) mottles; massive; firm; few very fine roots; few snail shells and fragments of shells; few pebbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 22 to 46 inches. The Akp and Ak horizons have hue of 10YR or 5Y or are neutral in hue. They have chroma of 0 or 1. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 3 to 6 and chroma of 2 or less. In some pedons the lower part of this horizon is silt loam, loam, or clay loam. The Cg horizon is very

fine sandy loam, clay loam, or silty clay loam.

Harvard Series

The Harvard series consists of well drained soils on ridgetops and side slopes on outwash plains and stream terraces. Permeability is moderate in the upper part of the profile and moderately rapid in the lower part. These soils formed in loess and in the underlying loamy, stratified outwash or alluvium. Slope ranges from 2 to 5 percent.

Typical pedon of Harvard silt loam, 2 to 5 percent slopes, in a cultivated field, 400 feet south and 1,020 feet east of the northwest corner of sec. 2, T. 10 N., R. 7 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many very fine roots; medium acid; abrupt smooth boundary.

BE—9 to 16 inches; brown (10YR 4/3) silt loam; moderate very fine subangular blocky structure; friable; many very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—16 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; few prominent brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt2—22 to 29 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common very fine roots; few prominent brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

2Bt3—29 to 35 inches; dark brown (7.5YR 4/4) loam; weak fine and medium subangular blocky structure; friable; common very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual smooth boundary.

2BC—35 to 60 inches; dark brown (7.5YR 4/4), stratified loam, silt loam, sandy clay loam, and sandy loam; few fine distinct brown (10YR 5/3) and common fine distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few very fine roots; neutral.

The thickness of the solum ranges from 40 to more than 60 inches. The thickness of the loess ranges from 20 to 40 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. Some pedons have an E horizon. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. The 2Bt horizon is silt loam, loam, sandy loam, or clay loam. The 2BC horizon and the 2C horizon, if it occurs, are dominantly stratified silt loam, loam, sandy loam, sandy clay loam, or clay loam but in some pedons have thin layers of loamy sand or sand.

Hennepin Series

The Hennepin series consists of well drained, moderately slowly permeable soils on side slopes in the uplands. These soils formed in glacial till. Slope ranges from 30 to 60 percent.

Typical pedon of Hennepin loam, in a wooded area of Strawn-Hennepin loams, 30 to 60 percent slopes, 1,750 feet east and 2,600 feet south of the northwest corner of sec. 4, T. 9 N., R. 8 E.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; few pebbles; slight effervescence; mildly alkaline; clear smooth boundary.

Bw—4 to 16 inches; brown (7.5YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; few fine and medium roots; common faint very dark grayish brown (10YR 3/2) organic coatings in pores; few pebbles; strong effervescence; mildly alkaline; gradual smooth boundary.

C—16 to 60 inches; brown (7.5YR 5/4) loam; common medium faint strong brown (7.5YR 5/6) mottles; appears massive but has cleavage planes; firm; few fine roots; common fine concretions of iron and manganese oxide; common pebbles; violent effervescence; mildly alkaline.

The thickness of the solum ranges from 12 to 16 inches. The A horizon is loam or silt loam. The BA horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is loam, clay loam, or silt loam. The C horizon has hue of 7.5YR or 10YR. It ranges from sandy loam to clay loam.

Hickory Series

The Hickory series consists of well drained, moderately permeable soils on side slopes in the uplands. These soils formed in loamy glacial till or in a thin mantle of loess and in the underlying glacial till. Slope ranges from 8 to 50 percent.

Typical pedon of Hickory loam, 30 to 50 percent slopes, in a wooded area, 1,500 feet east and 780 feet south of the northwest corner of sec. 9, T. 7 N., R. 7 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) loam,

light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; many very fine and few fine roots; strongly acid; clear smooth boundary.
E—3 to 7 inches; brown (10YR 5/3) loam; moderate thin platy structure; very friable; common very fine roots; very strongly acid; abrupt smooth boundary.
Bt1—7 to 12 inches; yellowish brown (10YR 5/4) clay loam; moderate very fine subangular blocky structure; friable; common very fine roots; many faint brown (10YR 5/3) clay films and common distinct white (10YR 8/2 dry) silt coatings on faces of peds; about 1 percent pebbles; very strongly acid; clear smooth boundary.
Bt2—12 to 23 inches; yellowish brown (10YR 5/6) clay loam; moderate fine subangular blocky structure; firm; common very fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; about 2 percent pebbles; medium acid; gradual smooth boundary.
Bt3—23 to 33 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many distinct brown (7.5YR 5/4) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; about 2 percent pebbles; medium acid; gradual smooth boundary.
Bt4—33 to 45 inches; yellowish brown (10YR 5/4) clay loam; weak medium subangular blocky structure; firm; few very fine roots; common distinct dark brown (7.5YR 4/4) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; about 3 percent pebbles; medium acid; abrupt wavy boundary.
BC—45 to 60 inches; light olive brown (2.5Y 5/4) loam; weak medium prismatic structure; friable; few prominent dark brown (7.5YR 4/4) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; about 5 percent pebbles; mildly alkaline.

The thickness of the solum and the depth to carbonates range from 40 to more than 60 inches. The loess mantle, if it occurs, is less than 20 inches thick.

The A horizon has value of 2 to 4. It is loam, silt loam, or, clay loam. The E horizon has value of 4 to 6 and chroma of 2 to 4. The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. It is clay loam, loam, or silt loam.

Huntsville Series

The Huntsville series consists of well drained, moderately permeable soils on slight rises on flood plains near streams. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Huntsville silt loam, in an area of idle grassland, 500 feet north and 2,200 feet east of the southwest corner of sec. 6, T. 11 N., R. 5 E.

Ap—0 to 7 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine and common fine roots; slightly acid; clear smooth boundary.
A1—7 to 13 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure; friable; many very fine roots; slightly acid; clear smooth boundary.
A2—13 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure; friable; common very fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds and in pores; slightly acid; clear smooth boundary.
A3—18 to 28 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds and in pores; few fine dark soft accumulations of iron and manganese oxide; neutral; clear smooth boundary.
AC—28 to 38 inches; dark brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine dark soft accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.
C—38 to 60 inches; dark yellowish brown (10YR 4/4) silt loam that has strata of loam below a depth of 45 inches; massive; friable; few very fine roots; common distinct brown (10YR 5/3 dry) silt coatings on faces of cleavage planes; few fine dark soft accumulations of iron and manganese oxide; slightly acid.

The thickness of the solum ranges from 24 to 44 inches. The thickness of the mollic epipedon ranges from 24 to 36 inches. The texture is silt loam to a depth of at least 40 inches.

The A horizon has chroma of 1 or 2. Some pedons do not have an AC horizon. The C horizon has value of 3 to 5 and chroma of 3 or 4. It is dominantly silt loam, but in some pedons it has thin strata of loam, very fine sandy loam, fine sandy loam, or fine sand below a depth of 40 inches.

Ipava Series

The Ipava series consists of somewhat poorly drained soils on broad ridges in the uplands. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. These soils formed in loess. Slope ranges from 0 to 2 percent.

Typical pedon of Ipava silt loam, in a cultivated field, 100 feet west and 400 feet north of the southeast corner of sec. 10, T. 8 N., R. 5 E.

Ap—0 to 10 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium subangular blocky structure; friable; few prominent black (10YR 2/1) organic coatings on faces of peds; few very fine roots; slightly acid; abrupt smooth boundary.

A—10 to 19 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; friable; few prominent black (10YR 2/1) organic coatings on faces of peds; few very fine roots; slightly acid; clear smooth boundary.

Bt1—19 to 25 inches; brown (10YR 5/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6), few fine faint dark grayish brown (10YR 4/2), and few fine distinct grayish brown (2.5Y 5/2) mottles; moderate fine and medium subangular blocky structure; friable; few prominent very dark gray (10YR 3/1) clay films on faces of peds; few very fine roots; slightly acid; clear smooth boundary.

Bt2—25 to 38 inches; brown (10YR 5/3) silty clay; common fine distinct yellowish brown (10YR 5/6), grayish brown (2.5Y 5/2), and gray (10YR 6/1) mottles; moderate fine prismatic structure; firm; few very fine roots; common distinct dark gray (10YR 4/1) clay films and few faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

BC—38 to 51 inches; light olive brown (2.5Y 5/4) silty clay loam; common medium distinct light brownish gray (2.5Y 6/2) mottles; moderate medium prismatic structure; firm; few very fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds and few faint very dark gray (10YR 3/1) organic coatings and dark gray (10YR 4/1) clay films in pores; few fine concretions of iron and manganese oxide; neutral; gradual smooth boundary.

C—51 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium distinct light olive brown (2.5Y 5/4) and common fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; few distinct very dark gray (10YR 3/1) organic coatings in pores; common fine concretions of iron and manganese oxide; mildly alkaline.

The thickness of the solum ranges from 45 to more than 60 inches. The thickness of the mollic epipedon ranges from 14 to 19 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 4.

Jasper Series

The Jasper series consists of well drained soils on ridgetops and side slopes on outwash plains and stream terraces. These soils are moderately permeable in the upper part and rapidly permeable in the lower part. They formed in loamy outwash and are underlain by sandy outwash. Slope ranges from 1 to 4 percent.

Typical pedon of Jasper loam, sandy substratum, 1 to 4 percent slopes, in a grass pasture, 2,450 feet north and 900 feet west of the southeast corner of sec. 3, T. 10 N., R. 8 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; many very fine roots; medium acid; clear smooth boundary.

A—10 to 18 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; common very fine roots; slightly acid; clear smooth boundary.

Bt1—18 to 31 inches; brown (10YR 4/3) clay loam; moderate medium subangular blocky structure; friable; common faint very dark grayish brown (10YR 3/2) organic coatings and few faint dark brown (10YR 3/3) clay films on faces of peds; few very fine roots; slightly acid; clear smooth boundary.

Bt2—31 to 40 inches; brown (7.5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; friable; few faint dark brown (10YR 3/3) clay films on faces of peds; few very fine roots; slightly acid; clear smooth boundary.

BC—40 to 46 inches; brown (7.5YR 4/4) loamy sand; weak medium subangular blocky structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

C—46 to 60 inches; brown (7.5YR 4/4) loamy sand; single grained; loose; slightly acid.

The thickness of the solum ranges from 30 to 48 inches. The depth to loamy sand or sand is 40 inches or more. The thickness of the mollic epipedon ranges from 10 to 18 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 to 3. They are silt loam, loam, or fine sandy loam. The Bt horizon has value of 4 to 6 and chroma of 3 to 6. It is loam, clay loam, or sandy clay loam. The C horizon is loamy sand or sand and in some pedons is stratified.

Jules Series

The Jules series consists of well drained, moderately permeable soils on flats and slight rises on flood plains. These soils formed in calcareous alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Jules silt loam, in a cultivated field, 2,200 feet east and 75 feet south of the northwest corner of sec. 36, T. 10 N., R. 6 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; common yellowish brown (10YR 5/4) fragments of material from the C horizon; moderate medium granular structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slight effervescence; mildly alkaline; clear smooth boundary.

C1—8 to 18 inches; stratified dark grayish brown (10YR 4/2), very dark grayish brown (10YR 3/2), and yellowish brown (10YR 5/4) silt loam that has thin strata of loam; moderate thin bedding planes because of stratification; massive; friable; few very fine roots; slight effervescence; mildly alkaline; clear smooth boundary.

C2—18 to 32 inches; stratified dark grayish brown (10YR 4/2), very dark grayish brown (10YR 3/2), and yellowish brown (10YR 5/4) silt loam that has thin strata of very fine sandy loam and loam; moderate thin bedding planes because of stratification; massive; friable; few very fine roots; slight effervescence; mildly alkaline; clear smooth boundary.

C3—32 to 46 inches; stratified dark grayish brown (10YR 4/2), very dark grayish brown (10YR 3/2), and yellowish brown (10YR 5/4) silt loam, loamy fine sand, and loam; moderate thin bedding planes because of stratification; massive; friable; slight effervescence; mildly alkaline; clear smooth boundary.

C4—46 to 60 inches; stratified brown (10YR 4/3), dark grayish brown (10YR 4/2), very dark grayish brown (10YR 3/2), and yellowish brown (10YR 5/4) silt loam, loamy fine sand, and loam; moderate thin bedding planes because of stratification; massive; friable; common fine soft accumulations of iron and manganese oxide; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 6 to 9 inches and corresponds to the thickness of the Ap horizon. The Ap horizon has value of 4 or 5 and chroma of 2 to 4. The C horizon has value of 3 to 6 and chroma of 2 to 6.

Keomah Series

The Keomah series consists of somewhat poorly drained soils on broad ridgetops in the uplands. Permeability is moderate in the upper part of the profile and slow or moderately slow in the lower part. These soils formed in loess. Slope ranges from 0 to 2 percent.

Typical pedon of Keomah silt loam, in a cultivated field, 1,600 feet south and 1,500 feet east of the northwest corner of sec. 16. T. 10 N., R. 6 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak thin platy structure parting to weak fine granular; friable; few fine medium concretions of iron and manganese oxide; few very fine roots; neutral; clear smooth boundary.

E—8 to 15 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown (10YR 5/4) mottles; strong thin and medium platy structure; friable; few very fine roots; few fine and medium concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

BE—15 to 20 inches; grayish brown (10YR 5/2) silt loam; few fine distinct yellowish brown (10YR 5/6) and few fine faint brown (10YR 5/3) mottles; weak medium platy structure parting to weak very fine subangular blocky; friable; few very fine roots; many prominent light gray (10YR 7/2 dry) silt coatings on faces of peds and few distinct yellowish brown (10YR 5/4) clay films in root channels; few fine and medium concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt1—20 to 27 inches; brown (10YR 5/3) silty clay loam; many fine distinct dark yellowish brown (10YR 4/4) mottles; moderate fine and medium subangular blocky structure; friable; few very fine roots; common distinct light gray (10YR 7/2 dry) silt coatings and many distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine and medium concretions of iron and manganese oxide; strongly acid; abrupt smooth boundary.

Bt2—27 to 35 inches; grayish brown (10YR 5/2) silty

clay loam; many fine distinct yellowish brown (10YR 5/8) mottles; weak fine subangular blocky and moderate medium subangular blocky structure; friable; few very fine roots; common distinct light gray (10YR 7/2 dry) silt coatings and common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine concretions of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt3—35 to 46 inches; grayish brown (10YR 5/2) silty clay loam; many fine distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few distinct light gray (10YR 7/2 dry) silt coatings and few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine concretions of iron and manganese oxide; strongly acid; clear smooth boundary.

BC—46 to 60 inches; yellowish brown (10YR 5/4) silt loam; many fine distinct brownish yellow (10YR 6/6) and very pale brown (10YR 7/3) mottles; weak medium subangular blocky structure; friable; few very fine roots; few faint brown (10YR 5/3) clay films on faces of peds; common fine concretions of iron and manganese oxide; strongly acid.

The thickness of the solum ranges from 45 to more than 60 inches. The Ap horizon has chroma of 1 or 2. The E horizon has value of 4 or 5 and chroma of 1 to 3. The Bt horizon has value of 4 or 5 and chroma of 2 to 4. It is silty clay loam or silty clay. Some pedons have a C horizon within a depth of 60 inches. This horizon has hue of 2.5Y or 10YR, value of 4 or 5, and chroma of 2 to 4. It is silt loam.

Landes Series

The Landes series consists of well drained soils on low stream terraces, natural levees, and the higher parts of flood plains. Permeability is moderate or moderately rapid in the upper part of the profile and rapid in the lower part. These soils formed in loamy and sandy alluvium. Slope ranges from 1 to 5 percent.

Typical pedon of Landes loam, 1 to 5 percent slopes, in a cultivated field, 480 feet east and 590 feet south of the northwest corner of sec. 15, T. 10 N., R. 8 E.

Ap—0 to 8 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; weak fine and medium granular structure; friable; many very fine roots; neutral; abrupt smooth boundary.

A—8 to 13 inches; dark brown (10YR 3/3) loam; moderate fine and medium granular structure; friable; common very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few pebbles; neutral; clear smooth boundary.

Bw1—13 to 24 inches; dark brown (10YR 4/3) loam; moderate fine subangular blocky structure; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores; common pebbles; very slight effervescence; mildly alkaline; gradual smooth boundary.

Bw2—24 to 31 inches; dark brown (10YR 4/3) fine sandy loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings in pores; few pebbles; very slight effervescence; mildly alkaline; gradual smooth boundary.

BC—31 to 38 inches; dark brown (10YR 4/3) fine sandy loam; weak medium and coarse subangular blocky structure; very friable; few very fine roots; common pebbles; very slight effervescence; moderately alkaline; gradual smooth boundary.

C—38 to 60 inches; dark brown (10YR 4/3), stratified sandy loam and loamy sand; massive; very friable; few very fine roots; common pebbles; very slight effervescence; moderately alkaline.

The thickness of the solum ranges from 26 to 40 inches. The Ap and A horizons have chroma of 1 to 3. They are fine sandy loam, loam, or silt loam. The Bw horizon has value of 4 or 5 and chroma of 3 or 4. It is fine sandy loam or loam and may be stratified. It may contain as much as 10 percent fine gravel. The C horizon has value of 4 or 5 and chroma of 3 or 4. It is stratified sand, loamy sand, sandy loam, loam, or silt loam. It may contain as much as 10 percent fine gravel.

Lawson Series

The Lawson series consists of somewhat poorly drained, moderately permeable soils on slight rises on flood plains. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Lawson silt loam, in a cultivated field, 1,200 feet west and 2,000 feet north of the southeast corner of sec. 4, T. 11 N., R. 5 E.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; very friable; common very fine and fine roots; slightly acid; clear smooth boundary.

A1—9 to 17 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine subangular blocky structure parting to fine and medium granular;

friable; few very fine and fine roots; slightly acid; clear smooth boundary.

A2—17 to 24 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; few fine roots; slightly acid; clear smooth boundary.

A3—24 to 35 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate very fine and fine subangular blocky structure; friable; few very fine roots; slightly acid; clear smooth boundary.

A4—35 to 45 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; few thin lenses of fine sand; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; few very fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; common fine dark soft accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

C1—45 to 51 inches; grayish brown (10YR 5/2) silt loam; many medium distinct yellowish brown (10YR 5/4) mottles; weak fine and medium subangular blocky structure; friable; few very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine dark soft accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

C2—51 to 60 inches; grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) mottles; massive; friable; few fine roots; common fine dark soft accumulations of iron and manganese oxide; slightly acid.

The mollic epipedon ranges from 24 to 45 inches in thickness. The Ap and A horizons are silt loam or silty clay loam. The content of clay in the control section ranges from 18 to 30 percent. The C horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 3. It has strata of loam, sandy loam, or silty clay loam in some pedons.

Lena Series

The Lena series consists of very poorly drained, moderately rapidly permeable soils in slight depressions on flood plains. These soils formed in organic sediments. Slope ranges from 0 to 2 percent.

Typical pedon of Lena muck, in a bog, 1,200 feet east and 460 feet north of the southwest corner of sec. 30, T. 10 N., R. 7 E.

Oap—0 to 5 inches; sapric material, very dark gray (10YR 3/1) broken face and rubbed; common fine distinct very dark gray (N 3/0) and brown (10YR 4/3) mottles; about 5 percent fiber, a trace rubbed; weak fine subangular blocky structure; friable; few snail shells and shell fragments; violent effervescence; moderately alkaline; clear smooth boundary.

Oa1—5 to 10 inches; sapric material, very dark gray (10YR 3/1) broken face and rubbed; common fine distinct very dark gray (N 3/0), common fine prominent brown (7.5YR 4/4), and common fine prominent strong brown (7.5YR 4/6) mottles; about 5 percent fiber, a trace rubbed; weak medium subangular blocky structure; friable; few snail shells and shell fragments; violent effervescence; moderately alkaline; clear smooth boundary.

Oa2—10 to 18 inches; sapric material, very dark gray (10YR 3/1) broken face and rubbed; common fine distinct black (N 2/0) and common fine prominent dark brown (7.5YR 4/6) mottles; about 15 percent fiber, 8 percent rubbed; weak coarse subangular blocky structure; friable; common snail shells and shell fragments; violent effervescence; moderately alkaline; gradual smooth boundary.

Oa3—18 to 45 inches; sapric material, very dark gray (10YR 3/1) broken face and rubbed; common fine distinct black (N 2/0) and brown (10YR 4/3) mottles; about 20 percent fiber, 10 percent rubbed; massive; friable; common snail shells and shell fragments; violent effervescence; moderately alkaline; gradual smooth boundary.

Oa4—45 to 60 inches; mottled black (N 2/0) and very dark gray (10YR 3/1) sapric material; about 15 percent fiber, 8 percent rubbed; massive; friable; common snail shells and shell fragments; violent effervescence; moderately alkaline.

The Oa horizon has hue of 10YR or 7.5YR or is neutral in hue. It has value of 1 to 3 and chroma of 0 to 3. It is dominantly sapric material, but some pedons have hemic or fibric layers. Some hemic layers have no free carbonates.

Lenzburg Series

The Lenzburg series consists of well drained, moderately slowly permeable soils in graded and ungraded surface-mined areas. These soils formed in a mixture of fine-earth material and fragments of bedrock. Slope ranges from 1 to 60 percent.

Typical pedon of Lenzburg silt loam, 20 to 60 percent slopes, stony, in a coal mine spoil bank, 850 feet west and 2,150 feet north of the southeast corner of sec. 30, T. 9 N., R. 6 E.

A—0 to 3 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure parting to weak fine granular; firm; common fine and very fine roots; common pebbles; strong effervescence; mildly alkaline; clear wavy boundary.
C1—3 to 10 inches; grayish brown (10YR 5/2) and light gray (N 7/0) silty clay loam; massive; firm; thin reconstructed strata and a few fracture planes; common very fine and few coarse roots; few medium soft accumulations of iron and manganese oxide; common pebbles and channers of siltstone and shale; strong effervescence; moderately alkaline; clear smooth boundary.
C2—10 to 20 inches; brownish yellow (10YR 6/8) and light gray (10YR 7/1) silty clay loam; massive; firm; few very fine roots; few fine soft accumulations of iron and manganese oxide; many pebbles and channers of sandstone and shale; strong effervescence; moderately alkaline; clear wavy boundary.
C3—20 to 33 inches; brownish yellow (10YR 6/6) and gray (10YR 6/1) silty clay loam; few medium prominent light brownish gray (2.5Y 6/2) mottles; massive; firm; few very fine roots; few fine dark grayish brown (10YR 4/2) relict clay films and few fine very dark gray (N 3/0) organic coatings on faces of peds; few fine soft accumulations of iron and manganese oxide; many till pebbles and pebbles and channers of siltstone and shale; strong effervescence; moderately alkaline; abrupt wavy boundary.
C4—33 to 45 inches; light olive gray (5Y 6/2) and dark brown (10YR 3/3) silty clay loam; few fine prominent yellowish brown (10YR 5/6) and light yellowish brown (2.5Y 6/4) mottles; massive; firm; few very fine roots; many medium and coarse soft accumulations of iron and manganese oxide; common pebbles and channers of siltstone and shale; violent effervescence; moderately alkaline; abrupt smooth boundary.
C5—45 to 60 inches; dark grayish brown (2.5Y 4/2) and light olive gray (5Y 6/2) silty clay loam; massive; friable; few very fine roots; common coarse soft accumulations of iron and manganese oxide; common pebbles and channers of siltstone and shale; strong effervescence; mildly alkaline.

The fine-earth material has a few relict soil fragments of genetic horizons. The rock fragments are commonly soft shale and siltstone, but some are sandstone or limestone. The content of rock fragments in the control section ranges from 10 to 35 percent by volume. The fragments generally range from 2 millimeters to 15 centimeters in diameter but include some much larger stones and boulders. Shale and siltstone are the most numerous rock types throughout the profile.

The A horizon has hue of 10YR, 2.5Y, or 5Y, value of 2 to 5, and chroma of 1 to 6. It is channery loam, loam, clay loam, silt loam, or silty clay loam. The content of rock fragments ranges from 10 to 25 percent by volume. The C horizon has hue of 10YR, 2.5Y, 5Y, or 5G or is neutral in hue. It has value of 2 to 7 and chroma of 0 to 8. Many of the colors are relict and are not indicative of present soil drainage. This horizon is loam, clay loam, silt loam, silty clay loam, silty clay, or the channery or gravelly analogs of those textures. The content of rock fragments ranges from 15 to 35 percent by volume.

Lisbon Series

The Lisbon series consists of somewhat poorly drained soils on slight rises on till plains and on toe slopes on moraines. Permeability is moderate in the upper part of the profile and moderately slow in the lower part. These soils formed in loess and in the underlying loamy glacial till. Slope ranges from 0 to 2 percent.

Typical pedon of Lisbon silt loam, in a cultivated field, 100 feet east and 1,200 feet south of the northwest corner of sec. 11, T. 11 N., R. 7 E.

Ap—0 to 8 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak very fine and fine granular structure; friable; common very fine and fine and few medium roots; medium acid; abrupt smooth boundary.
AB—8 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; strong very fine subangular blocky structure; friable; common fine roots; slightly acid; clear smooth boundary.
Bt1—14 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct light brownish gray (10YR 6/2) and few fine faint yellowish brown (10YR 5/6) mottles; strong very fine and fine subangular blocky structure; friable; common fine roots; many distinct black (10YR 2/1) organic coatings and common distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine and medium soft accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.
Bt2—23 to 34 inches; light yellowish brown (2.5Y 6/4) silty clay loam; common fine prominent light brownish gray (10YR 6/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; many distinct dark gray (10YR 4/1) and brown (10YR 5/3) clay films on faces of peds and very few distinct

black (10YR 2/1) organic coatings on faces of peds and in pores; many fine and medium soft accumulations of iron and manganese oxide; neutral; clear smooth boundary.

2Bt3—34 to 41 inches; light brown (7.5YR 6/4) silty clay loam; common fine prominent light brownish gray (10YR 6/2) mottles; weak coarse subangular blocky structure; friable; few fine roots; few distinct reddish brown (5YR 5/3) clay films on faces of peds; few fine soft accumulations of iron and manganese oxide; common till pebbles; strong effervescence; moderately alkaline; clear smooth boundary.

2C—41 to 60 inches; brown (7.5YR 5/4) silt loam; few fine distinct strong brown (7.5YR 5/8) mottles; massive; friable; common fine roots; few fine soft accumulations of iron and manganese oxide; common pebbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 24 to 42 inches. The loess ranges from 20 to 40 inches in thickness.

The Ap horizon has value 2 or 3 and chroma of 1 to 3. The Bt and 2Bt horizons have hue of 10YR, 7.5YR, or 2.5Y, value of 4 to 6, and chroma of 2 to 6. The 2Bt horizon is silty clay loam, silt loam, loam, or clay loam. The 2C horizon is silt loam or loam.

Marseilles Series

The Marseilles series consists of moderately well drained, moderately deep soils on side slopes. Permeability is moderate in the upper part of the profile and slow in the lower part. These soils formed in material weathered from shale and siltstone and in a silty or loamy mantle less than 30 inches thick. Slope ranges from 15 to 60 percent.

Typical pedon of Marseilles silt loam, 15 to 30 percent slopes, in a permanent pasture, 400 feet south and 500 feet west of the northeast corner of sec. 33, T. 8 N., R. 7 E.

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; few brown (10YR 4/3) streaks; moderate fine granular structure; friable; many very fine roots; medium acid; abrupt smooth boundary.

E—6 to 10 inches; brown (10YR 4/3) silt loam; weak medium platy structure; friable; common very fine roots; few very dark grayish brown (10YR 3/2) channel fillings; medium acid; clear smooth boundary.

Bt1—10 to 17 inches; yellowish brown (10YR 5/6) silty clay loam; moderate very fine and fine subangular blocky structure; firm; common very fine roots; many faint dark yellowish brown (10YR 4/4) clay films and common prominent white (10YR 8/2 dry) silt coatings on faces of peds; medium acid; clear smooth boundary.

Bt2—17 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; many faint dark yellowish brown (10YR 4/4) clay films and common prominent white (10YR 8/2 dry) silt coatings on faces of peds; few fine soft accumulations of iron and manganese oxide; few shale channers; medium acid; clear smooth boundary.

Bt3—21 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common fine prominent light brownish gray (2.5Y 6/2) mottles; moderate fine subangular blocky structure; firm; common very fine roots; many faint dark yellowish brown (10YR 4/4) clay films and common prominent white (10YR 8/2 dry) silt coatings on faces of peds; few fine soft accumulations of iron and manganese oxide; few shale channers; medium acid; clear smooth boundary.

2Bt4—26 to 39 inches; olive (5Y 5/3) silty clay loam; many fine distinct light brownish gray (2.5Y 6/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate coarse subangular blocky; firm; few very fine roots; many prominent dark grayish brown (10YR 4/2) clay films on faces of peds; common shale channers; strongly acid; clear smooth boundary.

2Cr—39 to 60 inches; light olive brown (2.5Y 5/4) soft shale that has light yellowish brown (2.5Y 6/4), yellowish brown (10YR 5/6), and very dark gray (N 3/0) streaks; common channers of hard shale and few channers of sandstone; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches. It commonly corresponds to the depth to weathered bedrock.

The A horizon has value of 3 or 4 and chroma of 2 or 3. It is silt loam or silty clay loam. Some pedons do not have an E horizon. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. It is silt loam or silty clay loam. The 2Bt horizon has hue of 5Y or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is clay loam, silty clay loam, silty clay, or silt loam. The 2Cr horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 3 to 6 and chroma of 0 to 4. It is silty shale or siltstone.

Orion Series

The Orion series consists of somewhat poorly drained, moderately permeable soils on slight rises on flood plains and in upland drainageways. These soils formed in silty alluvium over an older buried soil. Slope ranges from 0 to 2 percent.

Typical pedon of Orion silt loam, in an area of pastured woodland, 550 feet west and 1,250 feet south of the northeast corner of sec. 25, T. 10 N., R. 6 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; thin layers of brown (10YR 5/3) loam; weak medium platy structure parting to weak very fine subangular blocky; friable; common very fine and few fine roots; mildly alkaline; clear smooth boundary.

C—6 to 24 inches; stratified dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; lenses of very dark gray (10YR 3/1) silt loam in the lower part; few fine faint grayish brown (10YR 5/2) wormcasts; massive; thin to thick bedding planes; friable; common fine soft accumulations of iron and manganese oxide; few very fine roots; mildly alkaline; abrupt smooth boundary.

Ab1—24 to 35 inches; black (10YR 2/1) silt loam; few fine distinct grayish brown (10YR 5/2) mottles; weak medium platy structure parting to weak very fine subangular blocky; friable; few distinct brown (10YR 5/3) root channel fillings; few fine soft accumulations of iron and manganese oxide; few very fine roots; neutral; clear smooth boundary.

Ab2—35 to 42 inches; very dark gray (10YR 3/1) silt loam; few fine faint dark grayish brown (10YR 4/2) mottles; moderate fine subangular blocky structure; friable; common faint black (10YR 2/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; few very fine roots; neutral; clear smooth boundary.

C′—42 to 60 inches; stratified dark grayish brown (10YR 4/2) and brown (10YR 4/3) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; weak medium bedding planes; few faint dark gray (10YR 4/1) coatings on faces of strata; common fine and medium concretions of iron and manganese oxide; mildly alkaline.

Depth to the buried horizon ranges from 20 to 40 inches. The A or Ap horizon has value of 4 or 5 and chroma of 2 or 3. The C horizon has value of 4 or 5 and chroma of 1 to 3. The Ab horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is silt loam or silty clay loam. The C′ horizon has value of 4 to 6 and chroma of 1 to 3.

Osceola Series

The Osceola series consists of somewhat poorly drained soils on wide ridges and flats in the uplands. These soils are moderately permeable in the upper part and slowly permeable in the lower part. They formed in loess and in the underlying material weathered from shale and siltstone. Slope ranges from 0 to 5 percent.

Typical pedon of Osceola silt loam, 0 to 2 percent slopes, in a cultivated field, 1,220 feet west and 314 feet north of the southeast corner of sec. 32, T. 12 N., R. 7 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

E—9 to 15 inches; grayish brown (10YR 5/2) silt loam; few fine prominent brown (7.5YR 4/4) mottles; moderate medium platy structure; friable; few fine roots; few distinct white (10YR 8/1) silt grains on faces of peds; few prominent dark stains of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Btg1—15 to 22 inches; dark grayish brown (10YR 4/2) silty clay; common fine prominent brown (7.5YR 4/4) and few fine distinct brown (10YR 4/3) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common fine roots; many distinct very dark grayish brown (10YR 4/2) and few distinct dark gray (10YR 4/1) clay films and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few prominent dark stains of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg2—22 to 33 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine prominent dark yellowish brown (10YR 4/4) and strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common prominent dark stains of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg3—33 to 41 inches; light brownish gray (2.5Y 6/2) and strong brown (7.5YR 4/6) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few distinct dark stains

of iron and manganese oxide; slightly acid; clear smooth boundary.

2Btg4—41 to 47 inches; mottled grayish brown (2.5Y 5/2) and brown (7.5YR 4/4) sandy clay loam; moderate medium prismatic structure; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few prominent dark stains of iron and manganese oxide; slightly acid; abrupt smooth boundary.

3Btg5—47 to 52 inches; gray (5Y 5/1) silty clay; common fine prominent yellowish brown (10YR 5/6) and light yellowish brown (2.5Y 6/4) mottles; moderate medium angular blocky structure; firm; few fine roots; few distinct dark gray (5Y 4/1) clay films on faces of peds; about 5 percent shale fragments; slightly acid; clear wavy boundary.

3Cr—52 to 60 inches; gray (5Y 5/1) silty clay shale; many medium prominent yellowish brown (10YR 5/6) and light yellowish brown (2.5Y 6/4) mottles; massive; firm; slightly acid.

The thickness of the solum ranges from 40 to 55 inches. The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3. The Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 2 to 4. It is silty clay or silty clay loam. The 2Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 2 to 6. It is sandy loam, sandy clay loam, or loamy sand. Some pedons do not have a 3Bt horizon. The 3Cr horizon is silty clay or clay shale.

Paxico Series

The Paxico series consists of somewhat poorly drained, moderately permeable soils on flats and slight rises on flood plains. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Paxico silt loam, frequently flooded, long duration, in a wooded area, 400 feet east and 800 feet south of the northwest corner of sec. 10, T. 11 N., R. 9 E.

A—0 to 11 inches; stratified dark gray (10YR 4/1), dark grayish brown (10YR 4/2), and brown (10YR 5/3) silt loam, light brownish gray (10YR 6/2) dry; common fine prominent strong brown (10YR 4/6) mottles; moderate thin platy structure; very friable; few very fine roots; few fine soft dark accumulations of iron and manganese oxide; slight effervescence; mildly alkaline; abrupt smooth boundary.

Cg1—11 to 20 inches; stratified dark brown (10YR 4/3), brown (10YR 5/3), and light brownish gray (10YR 6/2) silt loam; few fine distinct brownish yellow (10YR 6/6) mottles; massive; very friable; few very fine roots; common fine soft dark accumulations of iron and manganese oxide; slight effervescence; mildly alkaline; clear smooth boundary.

Cg2—20 to 30 inches; stratified dark grayish brown (10YR 4/2), brown (10YR 5/3), and light brownish gray (10YR 6/2) silt loam that has thin strata of sandy loam and loam; common fine prominent brownish yellow (10YR 6/6) mottles; massive; very friable; few very fine roots; many fine soft dark accumulations of iron and manganese oxide; slight effervescence; mildly alkaline; clear smooth boundary.

Cg3—30 to 43 inches; stratified grayish brown (2.5Y 5/2) and dark yellowish brown (10YR 4/4) silt loam; many fine prominent brownish yellow (10YR 6/8) mottles; massive; very friable; few very fine roots; many fine soft accumulations of iron and manganese oxide; strong effervescence; moderately alkaline; clear smooth boundary.

Cg4—43 to 60 inches; stratified dark brown (10YR 4/3), brown (10YR 5/3), and light brownish gray (10YR 6/2) silt loam; common fine faint light brownish gray (10YR 6/2) and many fine prominent strong brown (7.5YR 5/8) mottles; massive; very friable; few very fine roots; many fine soft dark accumulations of iron and manganese oxide; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 6 to 12 inches and corresponds to the thickness of the A or Ap horizon. The A or Ap horizon has value of 3 to 5 and chroma of 1 to 3. The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 4.

Peotone Series

The Peotone series consists of very poorly drained, moderately slowly permeable soils in shallow depressions in the uplands. These soils formed in silty colluvial sediments. Slope ranges from 0 to 2 percent.

Typical pedon of Peotone silty clay loam, in a cultivated field, 400 feet west and 140 feet north of the southeast corner of sec. 18, T. 10 N., R. 8 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine angular blocky structure parting to moderate fine granular; firm; many very fine roots; few fine soft accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.

A1—8 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; firm; many very fine roots; few fine soft

accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

A2—14 to 19 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; common fine faint very dark gray (10YR 3/1) mottles; moderate fine and medium granular structure; firm; many very fine roots; few fine soft accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

AB—19 to 26 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine prismatic structure parting to moderate very fine angular blocky; firm; common very fine roots; many faint black (10YR 2/1) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; neutral; gradual smooth boundary.

Bg1—26 to 34 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; common fine distinct olive gray (5Y 5/2) mottles; weak medium prismatic structure parting to moderate fine angular blocky; firm; few very fine roots; many faint black (10YR 2/1) organic coatings on faces of peds and common faint black (10YR 2/1) pressure faces on peds; few fine soft accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bg2—34 to 48 inches; dark gray (5Y 4/1) silty clay loam; common fine distinct olive gray (5Y 5/2) mottles; moderate medium prismatic structure parting to moderate fine and medium angular blocky; firm; few very fine roots; few faint very dark gray (5Y 3/1) and dark gray (5Y 4/1) pressure faces on peds; black (5Y 2/1) krotovinas; few fine soft accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

BCg—48 to 60 inches; gray (5Y 5/1) silty clay loam; common fine prominent light olive brown (2.5Y 5/4) mottles; weak medium prismatic structure parting to weak fine and medium subangular blocky; firm; few very fine roots; few faint dark gray (5Y 4/1) pressure faces on peds; few fine soft accumulations of iron and manganese oxide; mildly alkaline.

The thickness of the solum ranges from 38 to more than 60 inches. The Ap, A, and AB horizons have hue of 10YR or are neutral in hue. They have chroma of 0 or 1. The Bg horizon commonly has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 2 to 4 in the upper part and value of 4 to 6 in the lower part. It has chroma of 0 to 2. The BCg has hue of 5Y or 10YR or is neutral in hue. It has value of 5 or 6 and chroma of 0 or 1.

Plainfield Series

The Plainfield series consists of excessively drained, rapidly permeable soils on hummocky dunes on broad high stream terraces. These soils formed in sandy drift. Slope ranges from 3 to 18 percent.

Typical pedon of Plainfield loamy sand, 7 to 18 percent slopes, in a cultivated field, 440 feet north and 1,380 feet east of the southwest corner of sec. 6, T. 10 N., R. 9 E.

Ap—0 to 8 inches; dark brown (10YR 3/3) loamy sand, brown (10YR 5/3) dry; weak medium granular structure; very friable; few very fine roots; strongly acid; abrupt smooth boundary.

Bw1—8 to 16 inches; brown (7.5YR 4/4) sand; weak medium subangular blocky structure; very friable; many faint dark brown (7.5YR 3/4) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bw2—16 to 31 inches; strong brown (7.5YR 4/6) sand; weak coarse subangular blocky structure; very friable; slightly acid; gradual smooth boundary.

C—31 to 60 inches; strong brown (7.5YR 5/6) sand; single grained; loose; slightly acid.

The thickness of the solum ranges from 18 to 34 inches. The Ap horizon has value of 3 or 4 and chroma of 1 to 3. The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. The C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8.

Plano Series

The Plano series consists of well drained, moderately permeable soils on ridges and short, uneven side slopes on outwash plains and on stream terraces. These soils formed in loess and in the underlying stratified outwash. Slope ranges from 1 to 5 percent.

Typical pedon of Plano silt loam, 1 to 5 percent slopes, in a cultivated field, 2,450 feet west and 1,700 feet south of the northeast corner of sec. 3, T. 11 N., R. 6 E.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium subangular blocky structure parting to moderate fine granular; friable; common fine and medium roots; slightly acid; abrupt smooth boundary.

BA—11 to 20 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure;

friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—20 to 31 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; few very fine roots; common faint brown (10YR 4/3) and dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—31 to 42 inches; dark yellowish brown (10YR 4/4) silty clay loam; few medium faint yellowish brown (10YR 5/6) and pale brown (10YR 6/3) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common faint brown (10YR 4/3) clay films and few faint light gray (10YR 7/1 dry) silt coatings on faces of peds; few fine soft accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

2Bt3—42 to 53 inches; yellowish brown (10YR 5/4), stratified sandy loam and loam; few medium distinct light yellowish brown (2.5Y 6/4) and common medium faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few faint dark brown (10YR 3/3) clay films and common faint light gray (10YR 7/1 dry) silt coatings on faces of peds; common fine soft accumulations and common fine concretions of iron and manganese oxide; medium acid; abrupt smooth boundary.

2C—53 to 60 inches; brown (7.5YR 4/4), stratified loamy sand and sandy loam; common medium distinct yellowish brown (10YR 5/6) and few medium distinct pale brown (10YR 6/3) mottles; massive; friable; slightly acid.

The thickness of the solum ranges from 48 to 60 inches. The Ap horizon has value of 2 or 3 and chroma 1 to 3. The BA horizon has value of 3 or 4 and chroma of 2 to 4. The Bt and 2Bt horizons have chroma of 3 or 4. The 2C horizon has hue of 10YR, 2.5Y, or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is stratified loamy sand, sandy loam, loam, or silt loam.

Proctor Series

The Proctor series consists of well drained soils on ridgetops and side slopes on outwash plains and on stream terraces. Permeability is moderate in the upper part of the profile and moderate or moderately rapid in the lower part. These soils formed in loess or silty sediments and in the underlying stratified outwash. Slope ranges from 2 to 10 percent.

Typical pedon of Proctor silt loam, 2 to 5 percent slopes, in a cornfield, 2,460 feet west and 204 feet north of the southeast corner of sec. 3, T. 11 N., R. 6 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; medium acid; clear smooth boundary.

A—8 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

Bt1—11 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—16 to 23 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt3—23 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt4—28 to 33 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; friable; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt5—33 to 46 inches; strong brown (7.5YR 5/6), stratified loam and sandy loam; weak coarse subangular blocky structure; very friable; few very fine roots; common faint dark brown (7.5YR 4/4) clay films on faces of peds; slightly acid; gradual smooth boundary.

2C—46 to 60 inches; strong brown (7.5YR 5/6), stratified sandy loam and loamy sand; massive; very friable; slightly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The thickness of the loess or silty sediments ranges from 20 to 40 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 to 3. The Bt horizon has chroma of 3 to 6. The 2Bt horizon has value of 4 to 6 and chroma of 2 to 6. It is clay loam, silty clay loam, silt loam, loam, or sandy loam. The 2C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 6. It is stratified sandy loam, loam, loamy sand, or silt loam.

Proctor silt loam, 5 to 10 percent slopes, eroded, has

a thinner dark surface layer than is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Radford Series

The Radford series consists of somewhat poorly drained, moderately permeable soils on flats and slight rises on flood plains and in upland drainageways. These soils formed in silty alluvium over a buried soil. Slope ranges from 0 to 2 percent.

Typical pedon of Radford silt loam, in an alfalfa field, 1,200 feet west and 800 feet south of the northeast corner of sec. 33, T. 10 N., R. 5 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; very friable; common fine roots; neutral; clear smooth boundary.

A—7 to 15 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak thin platy structure parting to weak fine granular; very friable; common fine roots; neutral; clear smooth boundary.

C—15 to 24 inches; stratified very dark gray (10YR 3/1) and dark grayish brown (10YR 4/2) silt loam; massive; very friable; common fine roots; neutral; clear smooth boundary.

Ab1—24 to 32 inches; black (10YR 2/1) silty clay loam; moderate fine subangular blocky structure; very friable; common very fine roots; slightly acid; clear smooth boundary.

Ab2—32 to 38 inches; black (10YR 2/1) silty clay loam; moderate fine subangular blocky structure; very friable; common very fine roots; few fine dark soft accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bgb1—38 to 47 inches; very dark gray (10YR 3/1) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; very friable; common very fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; few fine dark soft accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bgb2—47 to 60 inches; mottled gray (10YR 5/1), grayish brown (2.5Y 5/2), and yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; very friable; common very fine roots; few distinct black (10YR 2/1) organic coatings and common distinct dark gray (10YR 4/1) clay films on faces of peds; common fine dark soft accumulations of iron and manganese oxide; neutral.

The mollic epipedon ranges from 10 to 24 inches in thickness. Depth to the buried soil ranges from 20 to 40 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. The C horizon has value of 2 to 6. The buried soil has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 2 to 5 and chroma 0 to 2. It is silty clay loam, clay loam, or silt loam.

Rapatee Series

The Rapatee series consists of well drained, slowly permeable and moderately slowly permeable soils on ridgetops and side slopes in reclaimed surface-mined areas. These soils formed in regolith derived from surface mining activities and in silty soil material that has been replaced after mining. The regolith is a mixture of fine-earth material and fragments of bedrock. The rock fragments are commonly soft shale and siltstone, but some are sandstone or limestone. Slope ranges from 1 to 12 percent.

Typical pedon of Rapatee silt loam, 1 to 5 percent slopes, 300 feet east and 1,200 feet north of the southwest corner of sec. 21, T. 9 N., R. 6 E.

Ap—0 to 4 inches; mixed very dark gray (10YR 3/1) and light yellowish brown (10YR 6/4) silt loam, gray (10YR 5/1) and very pale brown (10YR 8/4) dry; moderate fine subangular blocky structure parting to weak fine granular; friable; many very fine and fine and few medium and coarse roots; neutral; abrupt smooth boundary.

C1—4 to 15 inches; mixed black (10YR 2/1) and light yellowish brown (10YR 6/4) silt loam; few fine distinct grayish brown (10YR 5/2) mottles; massive; firm; many very fine, common fine, and few medium and coarse roots; few fine soft accumulations of iron and manganese oxide; few soil fragments with very slight effervescence; neutral; abrupt smooth boundary.

C2—15 to 43 inches; light olive (5Y 6/2) silt loam; massive; very firm; common very fine and fine and few medium roots; few medium and coarse soft accumulations of iron and manganese oxide; common pebbles and channers of limestone and shale; strong effervescence; moderately alkaline; clear smooth boundary.

C3—43 to 60 inches; dark greenish gray (5G 4/1) silty clay loam; few fine prominent olive (5Y 5/3) mottles; massive; firm; few very fine roots; common fine soft accumulations and few medium concretions of iron and manganese oxide; few pebbles and channers of limestone and shale; very slight effervescence; mildly alkaline.

The replaced topsoil material ranges from 10 to 30 inches in thickness. It has value of 2 to 6 and chroma of 1 to 4. It is silt loam or silty clay loam. The layers beneath the replaced topsoil material have hue of 10YR, 2.5Y, 5Y, 5G, 5GY, or 5GB, value of 4 to 6, and chroma of 1 to 8. They are loam, clay loam, silt loam, silty clay loam, or the channery analogs of those textures. The content of rock fragments ranges from 0 to 30 percent by volume. It generally increases with increasing depth.

Rozetta Series

The Rozetta series consists of moderately well drained, moderately permeable soils on broad ridgetops and side slopes in the uplands and on stream terraces. These soils formed in loess. Slope ranges from 1 to 10 percent.

Typical pedon of Rozetta silt loam, 1 to 5 percent slopes, in a pasture, 120 feet north and 1,200 feet west of the center of sec. 4, T. 7 N., R. 7 E.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; few yellowish brown (10YR 5/4) peds from the E horizon; weak fine and medium granular structure; friable; common very fine roots; few fine dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—8 to 13 inches; yellowish brown (10YR 5/4) silt loam; weak medium platy structure parting to weak fine granular; friable; common very fine and few medium roots; few fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt1—13 to 20 inches; yellowish brown (10YR 5/4) silty clay loam; moderate very fine and fine subangular blocky structure; firm; common very fine and few medium roots; common faint dark yellowish brown (10YR 4/4) clay films and common prominent white (10YR 8/2 dry) silt coatings on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—20 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine and few medium roots; many distinct dark yellowish brown (10YR 4/4) clay films and common prominent white (10YR 8/2 dry) silt coatings on faces of peds; common fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt3—28 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; common fine and medium faint light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films and common prominent white (10YR 8/2 dry) silt coatings on faces of peds; few fine dark accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt4—34 to 49 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct yellowish brown (10YR 5/8) and common fine distinct light brownish gray (10YR 6/2) mottles; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; firm; common distinct dark yellowish brown (10YR 4/4) clay films and common prominent white (10YR 8/2 dry) silt coatings on faces of peds; common fine dark accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

BC—49 to 59 inches; yellowish brown (10YR 5/4) silt loam; few fine faint yellowish brown (10YR 5/6) and common fine and medium distinct light gray (10YR 7/2) mottles; weak medium and coarse subangular blocky structure; firm; few fine roots; few faint dark yellowish brown (10YR 4/4) clay films and common prominent white (10YR 8/2 dry) silt coatings on faces of peds; many fine dark accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

C—59 to 60 inches; yellowish brown (10YR 5/4) silt loam; few fine faint yellowish brown (10YR 5/8) and few fine distinct light gray (10YR 7/2) mottles; massive; firm; common fine dark accumulations of iron and manganese oxide; strongly acid.

The thickness of the solum ranges from 42 to 60 inches. The Ap horizon has value of 2 to 5 and chroma of 2 or 3. Eroded pedons commonly do not have an E horizon. The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. The C horizon has value of 4 to 6 and chroma of 2 to 6.

Rushville Series

The Rushville series consists of poorly drained, very slowly permeable soils in depressions in the uplands. These soils formed in loess. Slope ranges from 0 to 2 percent.

Typical pedon of Rushville silt loam, in a cultivated field, 2,500 feet east and 1,050 feet south of the northwest corner of sec. 8, T. 11 N., R. 6 E.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; mixed with some grayish brown (10YR 5/2) material in the lower part; weak medium platy structure parting to weak medium granular; friable; few very fine roots;

common fine concretions of iron and manganese oxide; neutral; abrupt smooth boundary.

E—10 to 15 inches; gray (10YR 6/1) silt, light gray (10YR 7/1) dry; moderate thin platy structure; very friable; few very fine roots; common medium concretions and common fine soft accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.

Btg1—15 to 20 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films and common distinct white (10YR 8/2 dry) silt coatings on faces of peds; common medium concretions and common fine soft accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Btg2—20 to 33 inches; grayish brown (2.5Y 5/2) silty clay; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films and common distinct white (10YR 8/2 dry) silt coatings on faces of peds; common medium concretions and common coarse soft accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

Btg3—33 to 43 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to moderate medium angular blocky; firm; common faint grayish brown (2.5Y 5/2) clay films on faces of peds, few distinct very dark gray (10YR 3/1) organic coatings lining pores, and common distinct white (10YR 8/2 dry) silt coatings on faces of peds; many medium concretions and many coarse soft accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

Bg—43 to 50 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; few very fine roots; few fine grayish brown (2.5Y 5/2) clay films on faces of peds, few distinct very dark gray (10YR 3/1) organic coatings lining pores, and few distinct white (10YR 8/2 dry) silt coatings on faces of peds; common medium dark soft accumulations of iron and manganese oxide; common medium soft white accumulations of calcium carbonate; mildly alkaline; clear smooth boundary.

Cg—50 to 60 inches; gray (10YR 6/1) silt loam; many coarse prominent yellowish brown (10YR 5/6) mottles; massive; firm; common medium dark soft accumulations of iron and manganese oxide; common medium soft white accumulations of calcium carbonate; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 45 to more than 60 inches. The Ap horizon has value of 4 or 5 and chroma of 1 or 2. The E horizon has value of 5 or 6 and chroma of 1 or 2. It is silt or silt loam. The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of less than 3. The Cg horizon is silt loam or silty clay loam.

Sable Series

The Sable series consists of poorly drained, moderately permeable soils on broad flats and in shallow depressions and drainageways in the uplands. These soils formed in loess. Slope ranges from 0 to 2 percent.

Typical pedon of Sable silty clay loam, in a cultivated field, 2,400 feet west and 300 feet south of the northeast corner of sec. 7, T. 8 N., R. 6 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; friable; few fine roots; neutral; clear smooth boundary.

A—8 to 17 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular and angular blocky structure; firm; few fine roots; neutral; clear smooth boundary.

AB—17 to 22 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine prominent olive (5Y 5/3) mottles; moderate fine prismatic structure parting to moderate fine and medium subangular blocky; firm; few fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; few fine dark soft accumulations and common coarse concretions of iron and manganese oxide; neutral; clear smooth boundary.

Bg1—22 to 29 inches; olive gray (5Y 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct very dark gray (10YR 3/2) organic coatings on faces of peds; common fine dark soft accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg2—29 to 36 inches; olive gray (5Y 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular

blocky; firm; few fine roots; few faint gray (10YR 5/1) pressure faces on peds and few distinct very dark gray (10YR 3/1) organic coatings lining pores; common fine dark soft accumulations of iron and manganese oxide; mildly alkaline; clear smooth boundary.

BCg—36 to 46 inches; light olive gray (5Y 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure; firm; few faint grayish brown (10YR 5/2) pressure faces on peds and few faint dark gray (10YR 4/1) linings in pores; common fine dark soft accumulations of iron and manganese oxide; mildly alkaline; clear smooth boundary.

Cg—46 to 60 inches; gray (5Y 5/1) silt loam; common fine prominent brownish yellow (10YR 6/8) mottles; massive; friable; common medium dark soft accumulations of iron and manganese oxide; mildly alkaline.

The solum ranges from 40 to 60 inches in thickness. The mollic epipedon ranges from 13 to 24 inches in thickness.

The Ap and A horizons have hue of 10YR or are neutral in hue. They have value of 2 or 3 and chroma of 0 or 1. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. It is silty clay loam or silt loam.

Sarpy Series

The Sarpy series consists of excessively drained, rapidly permeable or very rapidly permeable soils on slight rises on flood plains. These soils formed in sandy alluvium. Slope ranges from 0 to 3 percent.

Typical pedon of Sarpy loamy sand, 0 to 3 percent slopes, in a wooded area, approximately 1,600 feet south and 1,500 feet west of the northeast corner of sec. 28, T. 7 N., R. 7 E.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) loamy sand, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; very friable; many very fine roots; few snail shells; very slight effervescence; mildly alkaline; clear smooth boundary.

C1—4 to 8 inches; brown (10YR 4/3) sand; single grained; loose; common very fine roots; few snail shells; slight effervescence; mildly alkaline; gradual smooth boundary.

C2—8 to 20 inches; brown (10YR 5/3) sand; single grained; loose; common very fine roots; few snail shells; slight effervescence; mildly alkaline; gradual smooth boundary.

C3—20 to 60 inches; brown (10YR 5/3) sand; single grained; loose; few snail shells; slight effervescence; mildly alkaline.

The A horizon has value of 3 or 4 and chroma of 1 or 2. It is loamy sand or fine sandy loam. The C horizon has value of 4 to 6 and chroma of 3 or 4. It has thin strata of finer textured material in some pedons.

Sawmill Series

The Sawmill series consists of poorly drained, moderately permeable soils on broad flats on flood plains and in small drainageways in the uplands. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Sawmill silty clay loam, in a cultivated field, 210 feet south and 2,140 feet east of the northwest corner of sec. 1, T. 11 N., R. 6 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; many very fine roots; few fine soft accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

A1—8 to 16 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to moderate fine granular; firm; common very fine roots; few fine soft accumulations and concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

A2—16 to 21 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium granular structure; firm; common very fine roots; few fine soft accumulations and concretions of iron and manganese oxide; neutral; clear smooth boundary.

A3—21 to 27 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine distinct dark grayish brown (2.5Y 4/2) mottles; moderate medium granular structure; firm; common very fine roots; many faint black (10YR 2/1) organic coatings on faces of peds; few fine soft accumulations and common fine and medium concretions of iron and manganese oxide; neutral; gradual smooth boundary.

A4—27 to 33 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; many fine distinct dark grayish brown (2.5Y 4/2) and common fine prominent grayish brown (2.5Y 5/2) mottles; moderate fine subangular blocky structure; firm;

common very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine soft accumulations and common fine and medium concretions of iron and manganese oxide; neutral; clear smooth boundary.

Bg1—33 to 40 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) and many fine faint grayish brown (2.5Y 5/2) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; common very fine roots; many distinct very dark gray (10YR 3/1) organic coatings and few distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine soft accumulations and common fine and few medium concretions of iron and manganese oxide; neutral; gradual smooth boundary.

Bg2—40 to 50 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; few very fine roots; many prominent very dark gray (10YR 3/1) organic coatings and few prominent very dark gray (10YR 3/1) clay films on faces of peds; few fine soft accumulations and few fine and medium concretions of iron and manganese oxide; neutral; gradual smooth boundary.

BCg—50 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam that has strata of silt loam; common fine distinct gray (5Y 6/1) and common fine prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure; firm; few very fine roots; few prominent very dark gray (10YR 3/1) clay films lining pores; few fine and medium concretions of iron and manganese oxide; few pebbles; mildly alkaline.

The solum ranges from 36 to more than 60 inches in thickness. The mollic epipedon ranges from 24 to 36 inches in thickness.

The Ap and A horizons have hue of 10YR, 2.5Y, or 5Y or are neutral in hue. They have chroma of 0 or 1. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has chroma of 2 or less. It is silty clay loam or clay loam. The Cg horizon is silty clay loam, clay loam, or silt loam.

Saybrook Series

The Saybrook series consists of well drained, moderately permeable soils on ridgetops and side slopes on till plains and moraines. These soils formed in loess and in the underlying loamy glacial till. Slope ranges from 2 to 10 percent.

The Saybrook soils in this county have a thinner dark surface soil than is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical pedon of Saybrook silt loam, 5 to 10 percent slopes, eroded, in a cultivated field, 228 feet south and 2,350 feet east of the northwest corner of sec. 17, T. 10 N., R. 7 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many very fine roots; medium acid; clear smooth boundary.

Bt1—8 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; firm; many very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings and clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—15 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; many very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

2Bt3—23 to 26 inches; brown (7.5YR 4/4) loam; moderate medium subangular blocky structure; firm; common very fine roots; many distinct dark brown (7.5YR 3/2) clay films on faces of peds; common pebbles; neutral; clear smooth boundary.

2BC—26 to 32 inches; brown (7.5YR 5/4) loam; weak coarse subangular blocky structure; firm; few very fine roots; common prominent dark brown (7.5YR 3/2) clay films on faces of peds; common pebbles; slight effervescence; mildly alkaline; gradual smooth boundary.

2C—32 to 60 inches; brown (7.5YR 5/4) loam; massive; firm; common pebbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 24 to 40 inches. The loess ranges from 20 to 40 inches in thickness.

The Ap horizon has value of 2 or 3 and chroma of 1 to 3. The Bt horizon generally has chroma of 3 to 6. In some pedons the lower part of this horizon is mottled or has hue of 2.5Y or chroma of 2. The 2Bt horizon has hue of 10YR, 2.5Y, or 7.5YR, value of 4 or 5, and chroma of 2 to 4. It is loam or clay loam. The 2BC and 2C horizons have hue of 10YR, 2.5Y, or 7.5YR, value of 4 to 6, and chroma of 3 or 4.

St. Charles Series

The St. Charles series consists of well drained, moderately permeable soils on slight rises on outwash

plains, on upland ridgetops, and on stream terraces. These soils formed in loess or silty sediments and in the underlying loamy outwash. Slope ranges from 2 to 10 percent.

Typical pedon of St. Charles silt loam, 2 to 5 percent slopes, in a cultivated field, 50 feet east and 1,600 feet south of the northwest corner of sec. 7, T. 11 N., R. 5 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; abrupt smooth boundary.

E—7 to 12 inches; brown (10YR 4/3) silt loam; weak medium platy structure; friable; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films in pores; medium acid; abrupt smooth boundary.

BE—12 to 17 inches; brown (10YR 4/3) silty clay loam; moderate fine angular blocky structure; friable; few very fine roots; strongly acid; clear smooth boundary.

Bt1—17 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium angular blocky structure; firm; few fine roots; few prominent brown (10YR 4/3) clay films on faces of peds; few medium concretions of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—26 to 37 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint brown (10YR 5/3) mottles below a depth of 33 inches; moderate medium and coarse angular blocky structure; firm; few fine roots; few prominent brown (10YR 4/3) clay films on faces of peds; few fine concretions of iron and manganese oxide; strongly acid; gradual smooth boundary.

Bt3—37 to 51 inches; yellowish brown (10YR 5/4) silty clay loam; weak coarse angular blocky structure; friable; few fine roots; few distinct brown (10YR 4/3) clay films and few faint white (10YR 8/1 dry) silt coatings on faces of peds; few fine concretions of iron and manganese oxide; strongly acid; abrupt smooth boundary.

2BC—51 to 60 inches; yellowish brown (10YR 5/4) loam; weak coarse angular blocky structure; friable; few faint brown (10YR 4/3) clay films on faces of peds; medium acid.

The thickness of the solum ranges from 44 to more than 60 inches. Depth to the loamy outwash ranges from 40 to 60 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 4 to 6. The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is silty clay loam or silt loam. The 2BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. It is loam, sandy loam, sandy clay loam, or silt loam and is stratified in some pedons. Some pedons have a 2C horizon, which has colors and textures similar to those of the 2BC horizon.

Starks Series

The Starks series consists of somewhat poorly drained, moderately permeable soils on stream terraces and low ridges in the uplands. These soils formed in loess and in the underlying loamy, stratified outwash. Slope ranges from 0 to 2 percent.

Typical pedon of Starks silt loam, in a cultivated field, 1,100 feet south and 2,150 feet west of the northeast corner of sec. 34, T. 9 N., R. 7 E.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

E—9 to 13 inches; brown (10YR 5/3) silt loam; few fine and medium faint yellowish brown (10YR 5/4) mottles; weak thin platy structure; friable; few very fine roots; few medium concretions of iron and manganese oxide; medium acid; abrupt smooth boundary.

Bt1—13 to 19 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and few fine distinct light gray (10YR 7/2) mottles; moderate very fine and fine subangular blocky structure; friable; few fine roots; common distinct brown (10YR 4/3) clay films and few prominent white (10YR 8/1 dry) silt coatings on faces of peds; few fine soft dark accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt2—19 to 26 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films and common prominent white (10YR 8/1 dry) silt coatings on faces of peds; common fine and medium soft accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

2Bt3—26 to 37 inches; light brownish gray (10YR 6/2) clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine roots; common

distinct grayish brown (10YR 5/2) clay films and very few prominent white (10YR 8/1 dry) silt coatings on faces of peds; common fine and medium soft accumulations of iron and manganese oxide; few pebbles; medium acid; gradual smooth boundary.

2Bt4—37 to 44 inches; grayish brown (10YR 5/2) clay loam; common fine and medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; few fine roots; few distinct grayish brown (10YR 5/2) clay films and very few white (10YR 8/1 dry) silt coatings on faces of peds; few fine and medium soft accumulations of iron and manganese oxide; common pebbles; neutral; clear smooth boundary.

2C—44 to 60 inches; yellowish brown (10YR 5/4), stratified loam, clay loam, and sandy loam; common fine and medium distict yellowish brown (10YR 5/8) mottles; massive; firm; few fine soft accumulations of iron and manganese oxide; common pebbles; neutral.

The thickness of the solum ranges from 40 to more than 60 inches. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value 5 or 6 and chroma of 2 or 3. The Bt horizon has value of 4 to 6 and chroma of 2 to 4. The 2Bt horizon has chroma of 2 to 4. It is loam, clay loam, or silty clay loam.

Strawn Series

The Strawn series consists of well drained soils on side slopes on dissected till plains. These soils are moderately permeable in the upper part and moderately slowly permeable in the lower part. They formed in glacial till. Slope ranges from 8 to 60 percent.

Typical pedon of Strawn silt loam, 15 to 30 percent slopes, in wooded area, 1,080 feet west and 280 feet north of the southeast corner of sec. 5, T. 11 N., R. 8 E.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, gray (10YR 5/1) dry; weak thin platy structure parting to moderate fine granular; very friable; many fine and medium roots; neutral; clear smooth boundary.

Bt1—5 to 13 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common fine and medium roots; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; very few pebbles; neutral; clear smooth boundary.

Bt2—13 to 20 inches; dark brown (7.5YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; common pebbles; neutral; clear smooth boundary.

BC—20 to 24 inches; brown (7.5YR 5/4) clay loam; weak medium subangular blocky structure; friable; few very fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common pebbles; strong effervescence; moderately alkaline; clear smooth boundary.

C—24 to 60 inches; brown (7.5YR 5/4) loam; appears massive but has cleavage planes; friable; many pebbles; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 10 to 24 inches. As much as 10 inches of loess overlies the glacial till in some pedons.

The Ap or A horizon has value of 3 to 5 and chroma of 2 or 3. It is silt loam, silty clay loam, or loam. The Bt horizon has value of 4 or 5. It is silty clay loam, clay loam, or loam. The C horizon is loam, silt loam, or clay loam.

The Strawn soil in the map unit Strawn-Hennepin loams, 30 to 60 percent slopes, has a higher content of clay in the control section than is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Sylvan Series

The Sylvan series consists of moderately well drained and well drained, moderately permeable soils on side slopes in the uplands. These soils formed in loess. Slope ranges from 5 to 20 percent.

Typical pedon of Sylvan silty clay loam, 15 to 20 percent slopes, severely eroded, in a pasture, 1,140 feet west and 39 feet south of the northeast corner of sec. 2, T. 7 N., R. 7 E.

Ap—0 to 7 inches; mixed brown (10YR 4/3) and yellowish brown (10YR 5/4) silty clay loam, pale brown (10YR 6/3) and very pale brown (10YR 7/4) dry; weak fine and medium granular structure; friable; many very fine and few fine roots; slightly acid; abrupt smooth boundary.

Bt—7 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

BC—16 to 23 inches; yellowish brown (10YR 5/4) silt loam; common fine prominent pale red (2.5YR 6/2) and common fine faint yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; common very fine roots; few fine soft dark

accumulations of iron and manganese oxide and few fine soft white accumulations of calcium carbonate; slight effervescence; mildly alkaline; clear smooth boundary.

C—23 to 60 inches; yellowish brown (10YR 5/4) silt loam; many fine and medium prominent pale red (2.5YR 6/2), common fine faint dark yellowish brown (10YR 4/4), and common fine distinct yellowish brown (10YR 5/6 and 5/8) mottles; massive; friable; few very fine roots; few fine soft white accumulations of calcium carbonate; very few snail shells; slight effervescence; mildly alkaline.

The thickness of the solum and the depth to carbonates range from 16 to 40 inches. The Ap horizon has value of 4 or 5 and chroma of 2 to 4. The Bt horizon has value of 4 or 5 and generally has chroma of 3 to 5. In some pedons, however, it has chroma of 2 in the lower part. In areas where slopes are more than 10 percent, mottles in this horizon are relict. In areas where slopes are less than 10 percent, chroma of 2 in coatings on the exterior of peds in the Bt horizon is indicative of wetness in the modern soils. The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6.

Tama Series

The Tama series consists of moderately well drained, moderately permeable soils on ridgetops and side slopes in the uplands and on stream terraces. These soils formed in loess. Slope ranges from 1 to 10 percent.

Typical pedon of Tama silt loam, 1 to 5 percent slopes, in a cultivated field, 200 feet east and 850 feet north of the southwest corner of sec. 4, T. 11 N., R. 6 E.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; abrupt smooth boundary.

AB—11 to 16 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate medium granular structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—16 to 23 inches; brown (10YR 4/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt2—23 to 30 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine soft dark accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt3—30 to 43 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine soft dark accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

BC—43 to 53 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to weak coarse subangular blocky; friable; few very fine roots; few faint dark grayish brown (10YR 4/2) clay films and common faint light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine soft dark accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

C—53 to 60 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; massive; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine soft dark accumulations of iron and manganese oxide; neutral.

The thickness of the solum ranges from 40 to more than 60 inches. The mollic epipedon ranges from 10 to 20 inches in thickness.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is silt loam or silty clay loam. The C horizon has value of 4 or 5 and chroma of 3 to 6.

Tama silt loam, 5 to 10 percent slopes, eroded, has a thinner dark surface layer than is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Titus Series

The Titus series consists of poorly drained soils on broad flats and in narrow depressions and sloughs on flood plains. Permeability is slow in the upper part of the profile and moderately slow in the lower part. These soils formed in silty and clayey alluvial sediments. Slope ranges from 0 to 2 percent.

Typical pedon of Titus silty clay loam, in a pasture, 2,600 feet west and 750 feet south of the northeast corner of sec. 27, T. 7 N., R. 7 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium granular structure; firm; common very fine and few fine roots; neutral; clear smooth boundary.

A—7 to 12 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; few fine faint dark gray (N 4/0) mottles; weak medium angular blocky structure parting to weak medium granular; firm; few fine roots; few fine soft dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bg1—12 to 18 inches; dark gray (5Y 4/1) silty clay; common fine prominent brown (10YR 4/3) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; firm; few fine roots; few fine soft dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bg2—18 to 24 inches; dark gray (5Y 4/1) silty clay; common fine prominent dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure parting to moderate fine subangular blocky; firm; few fine roots; few faint dark gray (5Y 4/1) pressure faces on peds; common fine soft dark accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bg3—24 to 35 inches; dark gray (5Y 4/1) silty clay; common fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many faint dark gray (5Y 4/1) pressure faces on peds; common fine and medium soft dark accumulations of iron and manganese oxide; few white concretions of calcium carbonate below a depth of 30 inches; slight effervescence; neutral; gradual smooth boundary.

BCg—35 to 46 inches; gray (5Y 5/1) silty clay loam; common fine prominent light olive brown (2.5Y 5/4) and common fine prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; few fine roots; few faint dark gray (5Y 4/1) pressure faces on peds and clay films lining pores; common fine soft dark accumulations of iron and manganese oxide; few white concretions of calcium carbonate; strong effervescence; mildly alkaline; gradual wavy boundary.

Cg—46 to 60 inches; light olive gray (5Y 6/2), stratified silt loam and loam; many fine prominent light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; common fine soft dark accumulations of iron and manganese oxide; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 35 to 55 inches. The thickness of the mollic epipedon ranges from 12 to 24 inches.

The Ap and A horizons have hue of 10YR or are neutral in hue. They have value of 2 or 3 and chroma of 0 to 2. They are silty clay loam or silty clay. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It is silty clay loam or silty clay. The Cg horizon is stratified silty clay loam, silt loam, loam, sandy loam, loamy sand, or sand.

Virgil Series

The Virgil series consists of somewhat poorly drained soils on flats on outwash plains. These soils are moderately permeable in the upper part and moderately permeable or moderately rapidly permeable in the lower part. They formed in loess and in the underlying loamy outwash. Slope ranges from 0 to 2 percent.

Typical pedon of Virgil silt loam, in a cultivated field, 50 feet east and 2,260 feet north of the southwest corner of sec. 7, T. 11 N., R. 5 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, gray (10YR 5/1) dry; mixed with some brown (10YR 5/3) E material in the lower part; weak medium granular structure and some weak medium platy structure in the lower part; friable; common very fine roots; few fine concretions of iron and manganese oxide; slightly acid; abrupt smooth boundary.

E—9 to 14 inches; grayish brown (10YR 5/2) silt loam; few fine prominent strong brown (7.5YR 5/6) mottles; moderate thin platy structure; friable; few very fine roots; few fine concretions of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Bt—14 to 23 inches; brown (10YR 5/3) silty clay loam; few fine prominent strong brown (7.5YR 5/6) and common fine distinct light brownish gray (10YR 6/2) mottles; moderate fine subangular blocky structure; friable; few very fine roots; many faint dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) clay films on faces of peds; few fine concretions of iron and manganese oxide; medium acid; clear smooth boundary.

Btg1—23 to 30 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak fine prismatic structure parting to moderate fine angular blocky;

firm; few very fine roots; common prominent grayish brown (10YR 5/2) clay films on faces of peds and common faint dark grayish brown (10YR 4/2) clay films in pores; few fine concretions of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—30 to 42 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (10YR 5/6) and few fine prominent brown (7.5YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine concretions of iron and manganese oxide; strongly acid; gradual smooth boundary.

Btg3—42 to 50 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) and common fine prominent brown (7.5YR 4/4) mottles; weak coarse subangular blocky structure; friable; few faint grayish brown (10YR 5/2) clay films on faces of peds and in pores; few fine soft accumulations and few fine concretions of iron and manganese oxide; medium acid; abrupt smooth boundary.

2Btg4—50 to 60 inches; light brownish gray (2.5Y 6/2) clay loam; common medium prominent strong brown (7.5YR 5/6) and few fine prominent brown (7.5YR 4/4) mottles; weak coarse subangular blocky structure; friable; few faint grayish brown (10YR 5/2) clay films on faces of peds; common fine concretions of iron and manganese oxide; medium acid.

The thickness of the solum ranges from 48 to more than 60 inches. The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 or 5 and chroma of 1 or 2. The Bt and Btg horizons have value of 4 to 6 and chroma of 2 to 4. The 2Btg has colors similar to those of the Btg horizon. It is loam, clay loam, silt loam, or sandy loam.

Warsaw Series

The Warsaw series consists of well drained soils on flats on stream terraces. These soils are moderately permeable in the upper part and very rapidly permeable in the lower part. They formed in silty and loamy outwash over calcareous sand and gravel. Slope ranges from 0 to 3 percent.

Typical pedon of Warsaw silt loam, 0 to 3 percent slopes, in a hayfield, 1,800 feet east and 2,520 feet south of the northwest corner of sec. 32, T. 11 N., R. 9 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; very friable; common very fine roots; slightly acid; clear smooth boundary.

A—8 to 16 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to moderate fine granular; very friable; common very fine roots; neutral; clear smooth boundary.

Bt1—16 to 20 inches; dark brown (10YR 4/3) silty clay loam; moderate fine subangular structure; very friable; common very fine roots; few faint dark brown (10YR 3/3) clay films on faces of peds; few pebbles; neutral; gradual smooth boundary.

2Bt2—20 to 35 inches; dark brown (10YR 3/3) gravelly clay loam; weak medium and moderate coarse subangular structure; firm; common very fine roots; few faint dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

2C—35 to 60 inches; dark yellowish brown (10YR 4/4), coarsely stratified very gravelly sand and sand; single grained; loose; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 24 to 36 inches and commonly is the same as the depth to free carbonates and the depth to sand and gravel. The mollic epipedon ranges from 10 to 17 inches in thickness.

The Ap and A horizons have hue of 7.5YR or 10YR. They are silt loam, loam, or sandy loam. The Bt horizon has hue of 7.5YR or 10YR and chroma of 3 or 4. It is silty clay loam or clay loam. The 2Bt horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. It is gravelly clay loam or gravelly loam. The 2C horizon is sand or coarse sand in which the content of gravel is more than 20 percent.

Worthen Series

The Worthen series consists of well drained, moderately permeable soils on flats and side slopes on stream terraces. These soils formed in silty alluvium. Slope ranges from 1 to 5 percent.

Typical pedon of Worthen silt loam, 1 to 5 percent slopes, in a wheat field, 550 feet east and 1,250 feet north of the southwest corner of sec. 2, T. 10 N., R. 8 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium subangular blocky structure; friable; common very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

A—10 to 25 inches; very dark grayish brown (10YR 3/2)

silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; common very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; gradual smooth boundary.

Bw1—25 to 31 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; strong very fine subangular blocky structure; friable; few very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; gradual smooth boundary.

Bw2—31 to 39 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure; friable; few very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; gradual smooth boundary.

Bw3—39 to 47 inches; brown (10YR 4/3) silt loam; moderate medium subangular blocky structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

BC—47 to 60 inches; brown (7.5YR 4/4) silt loam; few fine faint pinkish gray (7.5YR 6/2) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few fine concretions of iron and manganese oxide; slightly acid.

The thickness of the solum ranges from 30 to more than 60 inches. The Ap and A horizons have value of 2 or 3 and chroma 1 to 3. The Bw horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma 2 to 4.

Formation of the Soils

Soil forms as the result of processes that act on deposited or exposed geologic material. The factors active in soil formation are the physical and mineralogical composition of the parent material; the climate under which the soil material has accumulated and existed since accumulation; the relief, or the lay of the land; the plant and animal life on and in the soil; and the length of time that the processes of soil formation have acted on the parent material *(7)*.

The effect of any single factor of soil formation generally is conditioned by the others. The soil-forming factors are so closely interrelated that few generalizations can be made regarding the effect of one factor unless conditions are specified for the others.

Parent Material

Parent material is the unconsolidated geologic material in which a soil forms. The mineralogical and chemical composition of the soil and the rate of profile development are largely determined by the parent material. The soils in Peoria County formed primarily in loess, till, outwash, and alluvium. In a few areas they formed in material weathered from bedrock or in a paleosol.

Loess, which is wind-blown silt, is the most extensive parent material in the uplands. The flood plains along the Mississippi and Illinois Rivers were the primary source of the loess. The loess was deposited during glacial periods when sediments transported in glacial meltwater and deposited on flood plains were highly susceptible to soil blowing. Loess deposits are thickest near the major flood plains. The thickness decreases as the distance from the source increases. Generally, it also decreases as the slope gradient increases. On gently sloping, relatively undissected uplands, the loess is generally 10 to 25 feet thick *(17)*. Tama, Ipava, and Sable are examples of soils in areas where the loess is thick.

Glacial till, an unsorted, unstratified geologic material deposited directly from glacial ice, underlies the loess in all areas of the county, except for those where slopes are more than about 10 percent. Two till members represent successive glacial stages in the county. Wisconsin loam till is in the northeastern part. The numerous moraines in this area are evidence of multiple advances and retreats of the late Wisconsin ice sheet. Saybrook and Lisbon soils formed in loess and Wisconsin glacial till. Strawn soils formed dominantly in this glacial till. Loamy Illinoian glacial till is common in the western and southwestern parts of the county. Hickory soils formed dominantly in Illinoian glacial till.

A paleosol represents a former soil that formed during the Sangamonian interglacial period. It generally underlies Peoria loess of Wisconsin age. Where the overlying layer of loess is thin, the paleosol is in the subsoil of the modern soil. In Peoria County the soils that have a paleosol are along the sides or at the head of drainageways in the dissected areas of the Illinoian till plain. Elco soils formed in loess and in a paleosol that formed in glacial till.

Glacial outwash is stratified sand and gravel and loamy material that is high in content of sand and gravel. It was deposited by glacial meltwater in front of moraines, in valleys, and on stream terraces. It may underlie several feet of loess, as in Plano and St. Charles soils, or it may make up the entire soil profile, as in Jasper soils. Most of the outwash deposits in the county are sandy. Soils in a few areas on terraces along the Illinois River are loamy in the upper part and sandy and gravelly in the lower part. Warsaw soils are an example.

Sand dunes are on wide terraces along the Illinois River in the northeastern part of the county. Plainfield soils are in areas where dunes are common.

The soils on flood plains formed in alluvium, which consists of recently deposited sediments. The rate of streamflow has a strong influence on the texture and color of alluvial soils. The coarser textured soils form in areas where water velocity is relatively high. The sandy Sarpy soils, which are typically near the channel of the Illinois River, are an example. The soils in areas farther from the channel of the river or on flood plains along the smaller streams formed in medium textured alluvium. Examples are Lawson, Wakeland, and Jules soils, which formed in silty sediments. Soils that have a

higher content of clay are in areas where the velocity of the floodwater is very slow or the surface is ponded. Titus soils are an example.

Bedrock is near the surface in areas where the landscape is very strongly dissected and an overlying layer of till, outwash, or loess does not occur. Marseilles soils formed primarily in material weathered from shale and siltstone. Osceola soils formed in loess and in the underlying residuum of siltstone and shale. They are in an area of uplands near Princeville, in the north-central part of the county.

Plant and Animal Life

Living organisms interact with the other soil-forming factors. The native vegetation in Peoria County consisted primarily of tall prairie grasses and deciduous hardwoods. Over time, each of these vegetative types exerted a strong influence on soil formation.

The dark surface layer of soils that formed under prairie grasses is relatively thick because additions of organic material have been both on the surface and in the root zone. The soils in broad, nearly level and gently sloping areas typically formed under prairie grasses. Ipava, Sable, and Tama soils are examples.

The dark surface layer of soils that formed under deciduous hardwoods is relatively thin because organic material generally has been added only on the surface. The soils bordering stream valleys in Peoria County typically formed under hardwoods. Fayette and Hickory soils are examples.

Animals affect soil formation to a limited extent. Earthworms, insects, and burrowing animals play a role in the incorporation and decomposition of plant and animal remains. Microorganisms are important in the decomposition of organic matter and in fixing nitrogen. Human activities, such as installing subsurface drains, building levees for flood protection, and surface mining of mineral resources, can extensively affect soil formation.

Climate

Peoria County has a temperate, humid, continental climate. Apart from slight variations related to slope aspect, climatic conditions have not caused any obvious differences among the soils within the county. The influence of climate becomes more evident, however, when comparisons are made on a broad, regional basis.

Climate affects soil formation through its influence on plant and animal life and on the process of weathering. Moisture and temperature influence the rate of the physical and chemical processes involved in weathering. Also, precipitation and the resulting percolation of water through the soil causes movement of the products of weathering, such as soluble salts and clay. Soil horizons form and become increasingly distinct with the movement and accumulation of these products. Differences in the rate and effectiveness of these processes contribute to soil variation.

Relief

Relief involves landscape characteristics, such as the gradient, shape, and aspect of slopes. As relief interacts with the other soil-forming factors, it strongly affects soil moisture, the rate of erosion, and the rate of soil formation.

Where the parent material is relatively uniform and medium textured, differences in natural drainage generally are closely related to slope. Soils that formed in the more sloping areas on uplands are generally moderately well drained or well drained. Tama, Catlin, and Fayette soils are examples. In contrast, somewhat poorly drained and poorly drained soils formed in the less sloping areas on uplands. They have a seasonal high water table near the surface during part of the year. Clarksdale, Ipava, and Sable soils are examples.

Relief also influences the intensity of erosion and the degree of profile development. On the steeper slopes, runoff and erosion may be significant enough to limit the development of well defined soil horizons. Marseilles and Hennepin soils are examples of these steeper soils.

Time

Time affects the degree of profile development in the soil. The influence of time, however, can be modified by the influences of relief and parent material. The effect of the interaction of relief and time is evident in areas of accelerated erosion or deposition. In some very steep soils, the surface soil is eroded so quickly that only a very thin solum forms in spite of exposure to weathering for thousands of years. Hennepin soils are an example. Soils on flood plains, such as the Sawmill and Wakeland soils, receive alluvial material during periods of flooding. They have weakly expressed soil horizons. In terms of profile development, they are much younger than many of the other soils in the county.

References

(1) American Association of State Highway and Transportation Officials. 1982. Standard specifications for highway materials and methods of sampling and testing. Ed. 13, 2 vols., illus.

(2) American Society for Testing and Materials. 1988. Standard test method for classification of soils for engineering purposes. ASTM Stand. D 2487.

(3) Anderson, Richard C., and R.E. Hunter. 1965. Sand and gravel resources of Peoria County. Ill. State Geol. Surv. Circ. 381, 16 pp., illus.

(4) Bergstrom, Robert E. 1956. Groundwater geology in western Illinois, north part. Ill. State Geol. Surv. Circ. 222, 21 pp., illus.

(5) Fehrenbacher, J.B., and others. 1978. Soil productivity in Illinois. Univ. of Ill. Agric. Ext. Sta. Circ. 1156, 21 pp., illus.

(6) Hudelson, G.W., and L.J. Bushue. 1972. General soils map and interpretation for Tri-County: Peoria, Tazewell, and Woodford Counties. Peoria, Tazewell, and Woodford Soil and Water Conserv. Dist., Tri-County Reg. Plann. Com., 23 pp., illus.

(7) Jenny, Hans. 1941. Factors of soil formation. 281 pp., illus.

(8) May, George W. 1968. Student's history of Peoria County, Illinois. 321 pp., illus.

(9) Mosier, J.G., and others. 1921. Peoria County soils. Univ. of Ill. Agric. Exp. Sta. Soil Rep. 19, 57 pp., illus.

(10) Odom, I. Edgar. 1973. Clay and shale resources of Peoria and Tazewell Counties, Illinois. Ill. State Geol. Surv. Miner. Note 49, 13 pp., illus.

(11) Smith, R.S., and H. Wascher. 1937. Peoria County soil types. Univ. of Ill. Agric. Exp. Sta., 12 pp., illus.

(12) Treworgy, Colin G., L.E. Bengal, and A.G. Dingwell. 1978. Reserves and resources of surface-minable coal in Illinois. Ill. State Geol. Surv. Circ. 504, 44 pp., illus.

(13) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus.

(14) United States Department of Agriculture. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210, 21 pp.

(15) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

(16) United States Department of Commerce, Bureau of the Census. 1984. 1982 census of agriculture. Vol. 1, part 13, 443 pp., illus.

(17) Willman, H.B., and J.C. Frye. 1970. Pleistocene stratigraphy of Illinois. Ill. State Geol. Surv. Bull. 94, 204 pp., illus.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of clay.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the

soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be below an A or a B horizon.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15

millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Paleosol. A soil that formed on a landscape during the geologic past and subsequently was buried by sedimentation. An exhumed paleosol is one that has been exposed by the erosive stripping of the overlying mantle of sediment.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range in moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5

Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in

stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951 to 1980 at Peoria, Illinois)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	29.7	13.3	21.5	59	-18	0	1.60	0.59	2.43	4	7.2
February	35.1	18.3	26.7	61	-12	1	1.39	.64	2.07	4	4.6
March	46.4	28.0	37.2	77	4	22	2.86	1.56	4.41	6	4.8
April	61.7	40.5	51.1	86	21	138	3.80	2.50	5.47	7	.9
May	72.4	50.5	61.5	91	32	366	3.88	2.16	5.20	7	.0
June	82.0	60.2	71.1	96	43	632	3.84	1.77	5.70	6	.0
July	85.5	64.6	75.0	98	50	776	3.98	2.63	5.56	6	.0
August	83.4	62.7	73.1	96	48	715	3.41	1.57	5.48	5	.0
September	76.8	54.7	65.7	94	36	473	3.66	1.45	5.21	6	.0
October	64.9	42.9	53.9	87	22	189	2.47	.74	4.00	4	.1
November	48.8	31.1	40.0	75	7	32	1.99	.96	2.76	4	2.6
December	35.5	20.2	27.8	64	-12	2	2.01	.78	3.00	5	6.1
Yearly:											
Average	60.3	40.7	50.5	---	---	---	---	---	---	---	---
Extreme	---	---	---	---	---	---	50.22	---	---	---	---
Total	---	---	---	---	---	3,346	34.89	17.35	51.29	64	26.3

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951 to 1980 at Peoria, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 14	May 2	May 12
2 years in 10 later than--	Apr. 8	Apr. 16	May 4
5 years in 10 later than--	Mar. 29	Apr. 8	Apr. 24
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 22	Oct. 10	Oct. 5
2 years in 10 earlier than--	Oct. 29	Oct. 18	Oct. 8
5 years in 10 earlier than--	Nov. 6	Oct. 26	Oct. 23

TABLE 3.--GROWING SEASON

(Recorded in the period 1951 to 1980 at Peoria, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	194	178	160
8 years in 10	210	190	167
5 years in 10	221	202	178
2 years in 10	234	219	192
1 year in 10	242	225	204

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
8D	Hickory silt loam, 8 to 15 percent slopes	3,070	0.8
8E	Hickory silt loam, 15 to 30 percent slopes	10,915	2.7
8G	Hickory loam, 30 to 50 percent slopes	9,715	2.4
16	Rushville silt loam	675	0.2
17	Keomah silt loam	21,240	5.3
19C3	Sylvan silty clay loam, 5 to 10 percent slopes, severely eroded	17,115	4.3
19D3	Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded	3,475	0.9
19E3	Sylvan silty clay loam, 15 to 20 percent slopes, severely eroded	1,335	0.3
24C2	Dodge silt loam, 5 to 10 percent slopes, eroded	2,430	0.6
24D	Dodge silt loam, 10 to 18 percent slopes	2,030	0.5
28	Jules silt loam	5,745	1.4
36B	Tama silt loam, 1 to 5 percent slopes	23,385	5.8
36C2	Tama silt loam, 5 to 10 percent slopes, eroded	2,515	0.6
37B	Worthen silt loam, 1 to 5 percent slopes	1,325	0.3
43	Ipava silt loam	48,025	11.8
45	Denny silt loam	355	0.1
54B	Plainfield loamy sand, 3 to 7 percent slopes	1,480	0.4
54D	Plainfield loamy sand, 7 to 18 percent slopes	730	0.2
59	Lisbon silt loam	835	0.2
67	Harpster silty clay loam	460	0.1
68	Sable silty clay loam	15,800	3.9
74	Radford silt loam	925	0.2
77	Huntsville silt loam	1,740	0.4
87B	Dickinson sandy loam, 1 to 4 percent slopes	3,570	0.9
92A	Sarpy loamy sand, 0 to 3 percent slopes	1,100	0.3
104	Virgil silt loam	1,005	0.3
107	Sawmill silty clay loam	1,600	0.4
119D2	Elco silt loam, 8 to 15 percent slopes, eroded	4,260	1.1
119E	Elco silt loam, 15 to 20 percent slopes	1,810	0.4
131D2	Alvin fine sandy loam, 7 to 15 percent slopes, eroded	280	0.1
132	Starks silt loam	335	0.1
134B	Camden silt loam, 2 to 5 percent slopes	1,480	0.4
134C2	Camden silt loam, 5 to 10 percent slopes, eroded	1,025	0.3
134D2	Camden silt loam, 10 to 18 percent slopes, eroded	415	0.1
145B2	Saybrook silt loam, 2 to 5 percent slopes, eroded	1,610	0.4
145C2	Saybrook silt loam, 5 to 10 percent slopes, eroded	740	0.2
148B	Proctor silt loam, 2 to 5 percent slopes	2,015	0.5
148C2	Proctor silt loam, 5 to 10 percent slopes, eroded	360	0.1
149	Brenton silt loam	895	0.2
152	Drummer silty clay loam	1,815	0.5
171B2	Catlin silt loam, 2 to 5 percent slopes, eroded	1,330	0.3
171C2	Catlin silt loam, 5 to 10 percent slopes, eroded	550	0.1
198	Elburn silt loam	1,500	0.4
199B	Plano silt loam, 1 to 5 percent slopes	1,585	0.4
210	Lena muck	50	*
224D3	Strawn silty clay loam, 8 to 15 percent slopes, severely eroded	1,325	0.3
224E	Strawn silt loam, 15 to 30 percent slopes	5,635	1.4
239	Dorchester silt loam	2,120	0.5
243B	St. Charles silt loam, 2 to 5 percent slopes	815	0.2
243C2	St. Charles silt loam, 5 to 10 percent slopes, eroded	385	0.1
257	Clarksdale silt loam	12,470	3.1
259C2	Assumption silt loam, 5 to 10 percent slopes, eroded	655	0.2
259D2	Assumption silt loam, 10 to 15 percent slopes, eroded	280	0.1
279B	Rozetta silt loam, 1 to 5 percent slopes	34,295	8.4
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded	8,740	2.2
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded	10,585	2.6
280D2	Fayette silt loam, 10 to 15 percent slopes, eroded	3,910	1.0
280E	Fayette silt loam, 15 to 30 percent slopes	1,965	0.5
282F	Chute loamy fine sand, 18 to 35 percent slopes	1,440	0.4
290A	Warsaw silt loam, 0 to 3 percent slopes	2,635	0.7
304B	Landes loam, 1 to 5 percent slopes	1,565	0.4
330	Peotone silty clay loam	1,970	0.5
344B	Harvard silt loam, 2 to 5 percent slopes	575	0.1

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
386B	Downs silt loam, 1 to 5 percent slopes	3,830	1.0
404	Titus silty clay loam	1,405	0.3
406	Paxico silt loam, frequently flooded, brief duration	4,720	1.2
415	Orion silt loam	360	0.1
439B	Jasper loam, sandy substratum, 1 to 4 percent slopes	2,350	0.6
451	Lawson silt loam	3,925	1.0
533	Urban land	3,250	0.8
536	Dumps, mine	280	0.1
549C2	Marseilles silt loam, 5 to 10 percent slopes, eroded	70	*
549E	Marseilles silt loam, 15 to 30 percent slopes	4,670	1.2
549G	Marseilles silt loam, 30 to 60 percent slopes	7,630	1.9
567B2	Elkhart silty clay loam, 2 to 5 percent slopes, eroded	11,365	2.8
567C2	Elkhart silty clay loam, 5 to 10 percent slopes, eroded	6,305	1.6
709A	Osceola silt loam, 0 to 2 percent slopes	120	*
709B2	Osceola silt loam, 2 to 5 percent slopes, eroded	1,040	0.3
857G	Strawn-Hennepin loams, 30 to 60 percent slopes	10,595	2.6
864	Pits, quarries	345	0.1
865	Pits, gravel	940	0.2
871B	Lenzburg silt loam, 1 to 7 percent slopes, stony	4,275	1.1
871D	Lenzburg silt loam, 7 to 20 percent slopes, stony	1,870	0.5
871G	Lenzburg silt loam, 20 to 60 percent slopes, stony	2,185	0.5
872B	Rapatee silt loam, 1 to 5 percent slopes	925	0.2
872C	Rapatee silty clay loam, 5 to 12 percent slopes	185	*
2017	Keomah-Urban land complex	1,245	0.3
2036B	Tama-Urban land complex, 1 to 5 percent slopes	870	0.2
2224D	Strawn-Urban land complex, 8 to 20 percent slopes	1,395	0.3
2279B	Rozetta-Urban land complex, 3 to 8 percent slopes	7,235	1.8
2290A	Warsaw-Urban land complex, 0 to 3 percent slopes	1,380	0.3
2439B	Jasper, sandy substratum-Urban land complex, 1 to 7 percent slopes	1,905	0.5
2802B	Orthents-Urban land complex, undulating	6,235	1.5
3070	Beaucoup silty clay loam, frequently flooded	1,400	0.3
3406	Paxico silt loam, frequently flooded, long duration	1,065	0.3
7070	Beaucoup silty clay loam, rarely flooded	1,970	0.5
	Water	9,245	2.3
	Total	402,600	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
17	Keomah silt loam (where drained)
28	Jules silt loam (where protected from flooding or not frequently flooded during the growing season)
36B	Tama silt loam, 1 to 5 percent slopes
37B	Worthen silt loam, 1 to 5 percent slopes
43	Ipava silt loam
45	Denny silt loam (where drained)
59	Lisbon silt loam
67	Harpster silty clay loam (where drained)
68	Sable silty clay loam (where drained)
74	Radford silt loam
77	Huntsville silt loam
87B	Dickinson sandy loam, 1 to 4 percent slopes
104	Virgil silt loam (where drained)
107	Sawmill silty clay loam (where drained and either protected from flooding or not frequently flooded during the growing season)
132	Starks silt loam (where drained)
134B	Camden silt loam, 2 to 5 percent slopes
145B2	Saybrook silt loam, 2 to 5 percent slopes, eroded
148B	Proctor silt loam, 2 to 5 percent slopes
149	Brenton silt loam
152	Drummer silty clay loam (where drained)
171B2	Catlin silt loam, 2 to 5 percent slopes, eroded
198	Elburn silt loam
199B	Plano silt loam, 1 to 5 percent slopes
239	Dorchester silt loam (where protected from flooding or not frequently flooded during the growing season)
243B	St. Charles silt loam, 2 to 5 percent slopes
257	Clarksdale silt loam (where drained)
279B	Rozetta silt loam, 1 to 5 percent slopes
290A	Warsaw silt loam, 0 to 3 percent slopes
304B	Landes loam, 1 to 5 percent slopes
330	Peotone silty clay loam (where drained)
344B	Harvard silt loam, 2 to 5 percent slopes
386B	Downs silt loam, 1 to 5 percent slopes
404	Titus silty clay loam (where drained)
406	Paxico silt loam, frequently flooded, brief duration (where drained and either protected from flooding or not frequently flooded during the growing season)
415	Orion silt loam (where protected from flooding or not frequently flooded during the growing season)
439B	Jasper loam, sandy substratum, 1 to 4 percent slopes
451	Lawson silt loam (where protected from flooding or not frequently flooded during the growing season)
567B2	Elkhart silty clay loam, 2 to 5 percent slopes, eroded
709A	Osceola silt loam, 0 to 2 percent slopes (where drained)
709B2	Osceola silt loam, 2 to 5 percent slopes, eroded (where drained)
872B	Rapatee silt loam, 1 to 5 percent slopes
7070	Beaucoup silty clay loam, rarely flooded (where drained)

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
8D---------- Hickory	IIIe	74	24	26	51	2.8	4.7
8E---------- Hickory	VIe	---	---	---	---	2.4	4.0
8G---------- Hickory	VIIe	---	---	---	---	---	3.0
16---------- Rushville	IIIw	114	36	47	64	---	---
17---------- Keomah	IIw	129	39	52	72	5.1	8.5
19C3---------- Sylvan	IVe	97	30	46	57	4.4	7.2
19D3---------- Sylvan	IVe	93	---	44	55	4.2	6.9
19E3---------- Sylvan	VIe	---	---	---	---	3.8	6.4
24C2---------- Dodge	IIIe	118	39	51	66	4.8	8.0
24D---------- Dodge	IVe	90	---	---	55	4.5	7.3
28---------- Jules	IIw	129	41	53	73	5.2	8.7
36B---------- Tama	IIe	153	46	61	88	5.8	9.7
36C2---------- Tama	IIIe	146	43	58	84	5.5	9.2
37B---------- Worthen	IIe	151	46	62	87	5.9	9.7
43---------- Ipava	I	163	52	66	91	6.1	10.2
45---------- Denny	IIw	113	37	47	62	---	---
54B---------- Plainfield	IVs	45	18	---	45	2.5	4.0
54D---------- Plainfield	VIIs	---	---	---	---	2.2	3.7
59---------- Lisbon	I	155	51	63	92	5.2	9.8

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
67--Harpster	IIw	136	44	52	74	---	---
68--Sable	IIw	156	51	61	85	---	---
74--Radford	IIw	143	46	61	84	5.6	9.3
77--Huntsville	IIw	152	48	64	86	5.8	9.7
87B--Dickinson	IIe	99	37	45	77	3.9	6.5
92A--Sarpy	IVs	---	---	---	25	0.9	---
104--Virgil	I	148	45	60	84	5.6	9.3
107--Sawmill	IIIw	132	42	---	---	---	---
119D2--Elco	IIIe	101	33	42	58	4.0	6.6
119E--Elco	IVe	94	31	39	54	3.7	6.2
131D2--Alvin	IIIe	90	34	43	61	3.7	6.2
132--Starks	IIw	129	40	55	72	5.1	8.5
134B--Camden	IIe	124	39	55	71	5.0	8.2
134C2--Camden	IIIe	117	37	52	68	4.7	7.8
134D2--Camden	IIIe	112	35	50	65	4.5	7.5
145B2--Saybrook	IIe	133	44	58	81	5.4	8.9
145C2--Saybrook	IIIe	131	43	56	79	5.3	8.7
148B--Proctor	IIe	143	44	59	87	5.5	9.1
148C2--Proctor	IIIe	130	41	53	79	5.0	7.3
149--Brenton	I	160	47	62	91	5.9	9.8

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
152---------- Drummer	IIw	154	51	61	83	---	---
171B2---------- Catlin	IIe	144	44	59	84	5.6	9.3
171C2---------- Catlin	IIIe	141	43	57	82	5.5	9.1
198---------- Elburn	I	161	50	63	94	6.1	10.2
199B---------- Plano	IIe	150	45	60	89	5.8	9.6
210---------- Lena	Vw	---	---	---	---	---	---
224D3---------- Strawn	IVe	90	---	30	49	2.6	4.5
224E---------- Strawn	VIe	---	---	---	---	2.5	4.3
239---------- Dorchester	IIw	132	43	54	77	5.3	8.8
243B---------- St. Charles	IIe	126	39	56	72	5.1	8.5
243C2---------- St. Charles	IIIe	119	37	53	69	4.8	8.0
257---------- Clarksdale	I	140	43	57	79	5.3	8.8
259C2---------- Assumption	IIIe	120	37	53	72	4.7	7.8
259D2---------- Assumption	IIIe	116	35	50	70	4.5	7.6
279B---------- Rozetta	IIe	130	40	54	72	5.2	8.6
279C2---------- Rozetta	IIIe	123	38	51	69	4.9	8.2
280C2---------- Fayette	IIIe	121	37	50	69	4.9	8.1
280D2---------- Fayette	IIIe	116	35	48	66	4.7	7.8
280E---------- Fayette	VIe	---	---	---	---	3.4	6.9
282F---------- Chute	VIIs	---	---	---	---	---	3.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
290A---------- Warsaw	IIs	115	40	53	74	4.6	7.7
304B---------- Landes	IIe	98	34	44	61	3.7	6.1
330---------- Peotone	IIw	123	42	43	58	---	---
344B---------- Harvard	IIe	131	41	54	77	5.2	8.6
386B---------- Downs	IIe	147	43	59	82	5.6	9.2
404---------- Titus	IIIw	125	42	---	---	---	---
406---------- Paxico	IIIw	115	40	---	---	4.4	7.3
415---------- Orion	IIIw	135	48	---	---	4.7	7.8
439B---------- Jasper	IIe	113	38	47	70	4.6	7.5
451---------- Lawson	IIIw	161	48	---	---	5.7	9.5
533**. Urban land							
536**. Dumps							
549C2---------- Marseilles	IVe	96	33	42	59	4.0	6.6
549E---------- Marseilles	VIIe	---	---	---	---	---	5.4
549G---------- Marseilles	VIIe	---	---	---	---	---	---
567B2---------- Elkhart	IIe	126	38	51	71	4.9	8.3
567C2---------- Elkhart	IIIe	123	37	50	68	4.8	7.9
709A---------- Osceola	IIw	110	35	44	62	4.4	7.5
709B2---------- Osceola	IIe	105	32	41	60	4.2	7.2
857G---------- Strawn-Hennepin	VIIe	---	---	---	---	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
864**, 865**. Pits							
871B---------- Lenzburg	VIe	---	---	---	---	3.4	4.8
871D---------- Lenzburg	VIe	---	---	---	---	2.7	4.5
871G---------- Lenzburg	VIIe	---	---	---	---	---	---
872B---------- Rapatee	IIe	100	35	44	60	4.2	6.9
872C---------- Rapatee	IIIe	95	31	42	58	3.5	5.3
2017**. Keomah-Urban land							
2036B**. Tama-Urban land							
2224D**. Strawn-Urban land							
2279B**. Rozetta-Urban land							
2290A**. Warsaw-Urban land							
2439B**. Jasper-Urban land							
2802B**. Orthents-Urban land							
3070---------- Beaucoup	Vw	---	---	---	---	---	---
3406---------- Paxico	Vw	---	---	---	---	---	---
7070---------- Beaucoup	IIw	138	46	55	75	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
8D Hickory	5A	Slight	Slight	Slight	Slight	White oak Northern red oak Black oak Green ash Bitternut hickory Yellow poplar	85 85 --- --- --- 95	5 5 --- --- --- 7	Eastern white pine, red pine, yellow poplar, sugar maple, white oak, black walnut.
8E Hickory	5R	Moderate	Moderate	Slight	Slight	White oak Northern red oak Black oak Green ash Bitternut hickory Yellow poplar	85 85 --- --- --- 95	5 5 --- --- --- 7	Eastern white pine, red pine, yellow poplar, sugar maple, white oak, black walnut.
8G Hickory	5R	Severe	Severe	Slight	Slight	White oak Northern red oak Black oak Green ash Bitternut hickory Yellow poplar	85 85 --- --- --- 95	5 5 --- --- --- 7	Eastern white pine, red pine, yellow poplar, sugar maple, white oak, black walnut.
17 Keomah	3A	Slight	Slight	Slight	Slight	White oak Northern red oak	65 70	3 4	Eastern white pine, white oak, red pine, northern red oak, black walnut, sugar maple.
19C3 Sylvan	4A	Slight	Slight	Slight	Slight	White oak Northern red oak Yellow poplar Black walnut	80 80 90 ---	4 4 6 ---	Eastern white pine, northern red oak, green ash, Scotch pine, yellow poplar.
19D3 Sylvan	6A	Slight	Slight	Slight	Slight	Yellow poplar White oak Northern red oak Black walnut	90 80 80 ---	6 4 4 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
19E3 Sylvan	6R	Moderate	Moderate	Moderate	Slight	Yellow poplar White oak Northern red oak Black walnut	90 80 80 ---	6 4 4 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
24C2, 24D--Dodge	4A	Slight	Slight	Slight	Slight	Northern red oak	75	4	Eastern white pine, red pine, northern red oak, black walnut.
						Black cherry	---	---	
						White oak	---	---	
54B--Plainfield	4S	Slight	Slight	Moderate	Slight	Black oak	70	4	Red pine, eastern white pine, jack pine.
						White oak	55	3	
						Black cherry	---	---	
						Scarlet oak	68	4	
						Northern red oak	---	---	
54D--Plainfield	4R	Moderate	Severe	Moderate	Slight	Black oak	70	4	Red pine, eastern white pine, jack pine.
						White oak	55	3	
						Black cherry	---	---	
						Scarlet oak	68	4	
						Northern red oak	---	---	
77--Huntsville	7A	Slight	Slight	Slight	Slight	Yellow poplar	98	7	Eastern cottonwood, black walnut, American sycamore, red maple, sugar maple, green ash, hackberry.
						Eastern cottonwood	110	11	
						American sycamore	---	---	
						Cherrybark oak	---	---	
						Sweetgum	---	---	
						Green ash	---	---	
92A--Sarpy	3S	Slight	Slight	Severe	Slight	Silver maple	90	3	Eastern cottonwood, American sycamore, black willow.
						Eastern cottonwood	95	8	
104--Virgil	4A	Slight	Slight	Slight	Slight	White oak	80	4	White oak, northern red oak, black walnut, American sycamore, sugar maple, eastern cottonwood, eastern white pine, Scotch pine.
						Northern red oak	80	4	
						Black walnut	---	---	
107--Sawmill	5W	Slight	Moderate	Moderate	Moderate	Pin oak	90	5	American sycamore, black spruce, hackberry, European larch, green ash, pin oak, red maple, swamp white oak.
						Eastern cottonwood	---	---	
						Sweetgum	---	---	
						Cherrybark oak	---	---	
						American sycamore	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
119D2---------- Elco	4A	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Black walnut--------	80 --- ---	4 --- ---	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.
119E---------- Elco	4R	Moderate	Moderate	Moderate	Slight	White oak---------- Northern red oak---- Black walnut--------	80 --- ---	4 --- ---	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.
131D2---------- Alvin	4A	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Black walnut-------- Yellow poplar-------	80 80 --- 90	4 4 --- 6	Green ash, black walnut, yellow poplar, white oak, eastern white pine, American sycamore, sugar maple.
132---------- Starks	4A	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Yellow poplar------- Black walnut--------	80 80 90 ---	4 4 6 ---	Sugar maple, American sycamore, yellow poplar, white oak, green ash.
134B, 134C2, 134D2---------- Camden	7A	Slight	Slight	Slight	Slight	Yellow poplar------- White oak---------- Northern red oak---- Sweetgum---------- Green ash----------	95 85 85 80 76	7 5 5 6 5	White oak, black walnut, green ash, eastern white pine, red pine, yellow poplar, black locust, white ash.
224D3---------- Strawn	4A	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Yellow poplar------- Black walnut--------	80 80 90 ---	4 4 6 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
224E---------- Strawn	4R	Moderate	Moderate	Moderate	Slight	White oak---------- Northern red oak---- Yellow poplar------- Black walnut--------	80 80 90 ---	4 4 6 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
239---------- Dorchester	3A	Slight	Slight	Slight	Slight	White oak----------	55	3	Ponderosa pine, Austrian pine, Scotch pine, hackberry, green ash, cottonwood.
						Northern red oak----	55	3	
243B, 243C2----- St. Charles	7A	Slight	Slight	Slight	Slight	Yellow poplar-------	95	7	White oak, black walnut, sugar maple, eastern white pine, red pine.
						White oak----------	85	5	
						Northern red oak----	85	5	
						Sweetgum-----------	---	---	
						Green ash----------	---	---	
257---------- Clarksdale	4A	Slight	Slight	Slight	Slight	White oak----------	80	4	Black walnut, American sycamore, yellow poplar, white oak, green ash.
						Northern red oak----	80	4	
						Yellow poplar-------	90	6	
						Black walnut--------	---	---	
279B, 279C2----- Rozetta	4A	Slight	Slight	Slight	Slight	White oak----------	80	4	Eastern white pine, northern red oak, green ash, Scotch pine, yellow poplar.
						Northern red oak----	80	4	
						Yellow poplar-------	90	6	
						Black walnut--------	---	---	
280C2, 280D2---- Fayette	4A	Slight	Slight	Slight	Slight	White oak----------	80	4	Eastern white pine, northern red oak, green ash, yellow poplar.
						Northern red oak----	80	4	
						Yellow poplar-------	90	6	
						Black walnut--------	---	---	
280E---------- Fayette	4R	Moderate	Moderate	Slight	Slight	White oak----------	80	4	Eastern white pine, northern red oak, green ash, yellow poplar.
						Northern red oak----	80	4	
						Yellow poplar-------	90	6	
						Black walnut--------	---	---	
282F---------- Chute	3R	Moderate	Severe	Severe	Slight	Black oak----------	60	3	Eastern white pine, Scotch pine, eastern redcedar, black locust.
						White oak----------	---	---	
304B---------- Landes	7A	Slight	Slight	Slight	Slight	Yellow poplar-------	95	7	Eastern cottonwood, yellow poplar, American sycamore, sweetgum, green ash, black walnut, eastern white pine, sugar maple.
						Eastern cottonwood--	105	10	
						American sycamore---	---	---	
						Sweetgum-----------	---	---	
						Green ash----------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
386B---------- Downs	4A	Slight	Slight	Slight	Slight	White oak----------	80	4	Eastern white pine, northern red oak, green ash, yellow poplar.
						Northern red oak----	80	4	
						Yellow poplar-------	90	6	
						Black walnut--------	---	---	
404---------- Titus	2W	Slight	Severe	Severe	Moderate	Silver maple--------	80	2	Pin oak, swamp white oak, green ash, water tupelo, eastern cottonwood, American sycamore, hackberry, red maple, silver maple.
						Eastern cottonwood--	99	9	
						White ash----------	51	2	
406---------- Paxico	5A	Slight	Slight	Slight	Slight	Pin oak----------	96	5	American sycamore, eastern cottonwood, green ash, red maple, cherrybark oak.
						Sweetgum----------	86	7	
						Eastern cottonwood--	---	---	
						American sycamore---	---	---	
						White ash----------	---	---	
415---------- Orion	2W	Slight	Moderate	Slight	Slight	Silver maple--------	80	2	White spruce, silver maple, white ash, eastern cottonwood.
						Red maple----------	---	---	
						White ash----------	---	---	
451---------- Lawson	2W	Slight	Moderate	Slight	Slight	Silver maple--------	70	2	White spruce, silver maple, white ash.
						White ash----------	---	---	
						Red maple----------	---	---	
549C2---------- Marseilles	3A	Slight	Slight	Slight	Slight	White oak----------	66	3	White oak, northern red oak, black oak, white ash, eastern white pine, Scotch pine, black walnut.
						Northern red oak----	66	3	
						Black oak----------	---	---	
						White ash----------	---	---	
549E---------- Marseilles	3R	Moderate	Moderate	Slight	Slight	White oak----------	66	3	White oak, northern red oak, black oak, white ash, eastern white pine, Scotch pine, black walnut.
						Northern red oak----	66	3	
						Black oak----------	---	---	
						White ash----------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
549G---------- Marseilles	3R	Severe	Severe	Slight	Slight	White oak----------	66	3	White oak, northern red oak, black oak, white ash, eastern white pine, Scotch pine, black walnut.
						Northern red oak----	66	3	
						Black oak----------	---	---	
						White ash----------	---	---	
709A, 709B2----- Osceola	4A	Slight	Slight	Slight	Slight	White oak----------	70	4	Eastern white pine, red pine, Scotch pine, eastern redcedar.
						Northern red oak----	70	4	
						Green ash----------	---	---	
						Bur oak----------	---	---	
857G**: Strawn---------	4R	Severe	Severe	Moderate	Slight	White oak----------	80	4	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						Northern red oak----	80	4	
						Yellow poplar-------	90	6	
						Black walnut--------	---	---	
Hennepin-------	5R	Severe	Severe	Slight	Slight	Northern red oak----	85	5	Northern red oak, white oak, green ash, black walnut, eastern white pine, red pine, eastern redcedar.
						White oak----------	---	---	
871B, 871D------ Lenzburg	5A	Slight	Slight	Slight	Slight	Sweetgum-----------	76	5	Black walnut, green ash, white ash, eastern cottonwood.
						Black walnut--------	73	---	
						Eastern cottonwood--	---	---	
871G---------- Lenzburg	5R	Severe	Severe	Slight	Slight	Sweetgum-----------	76	5	Black walnut, green ash, white ash, eastern cottonwood.
						Black walnut--------	73	---	
						Eastern cottonwood--	---	---	
872B, 872C------ Rapatee	---	--------	--------	--------	--------		---	---	Black walnut, green ash, white ash, eastern cottonwood, black locust, American sycamore, eastern white pine.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
2017**:									
Keomah	3A	Slight	Slight	Slight	Slight	White oak	65	3	Eastern white pine, white oak, red pine, northern red oak, black walnut, sugar maple.
						Northern red oak	70	4	
Urban land.									
2224D**:									
Strawn	4A	Slight	Slight	Slight	Slight	White oak	80	4	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
						Northern red oak	80	4	
						Yellow poplar	90	6	
						Black walnut	---	---	
Urban land.									
2279B**:									
Rozetta	4A	Slight	Slight	Slight	Slight	White oak	80	4	Eastern white pine, northern red oak, green ash, Scotch pine, yellow poplar.
						Northern red oak	80	4	
						Yellow poplar	90	6	
						Black walnut	---	---	
Urban land.									
3070 Beaucoup	5W	Slight	Severe	Moderate	Moderate	Pin oak	90	5	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
						Eastern cottonwood	100	9	
						Sweetgum	---	---	
						Cherrybark oak	---	---	
						American sycamore	---	---	
3406 Paxico	5A	Slight	Slight	Slight	Slight	Pin oak	96	5	American sycamore, eastern cottonwood, green ash, red maple, cherrybark oak.
						Sweetgum	86	7	
						Eastern cottonwood	---	---	
						American sycamore	---	---	
						White ash	---	---	
7070 Beaucoup	5W	Slight	Severe	Moderate	Moderate	Pin oak	90	5	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
						Eastern cottonwood	100	9	
						Sweetgum	---	---	
						Cherrybark oak	---	---	
						American sycamore	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
8D, 8E, 8G-------- Hickory	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
16---------- Rushville	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
17---------- Keomah	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
19C3, 19D3, 19E3-- Sylvan	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
24C2, 24D--------- Dodge	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
28---------- Jules	---	Tatarian honeysuckle, Siberian peashrub.	Green ash, Osageorange, eastern redcedar, northern white-cedar, white spruce, nannyberry viburnum, Washington hawthorn.	Black willow------	---
36B, 36C2--------- Tama	---	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
37B---------- Worthen	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
43---------- Ipava	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
45---------- Denny	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern white-cedar, Norway spruce, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
54B, 54D---------- Plainfield	Siberian peashrub	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn olive, Amur honeysuckle, lilac, Tatarian honeysuckle.	Red pine, Austrian pine, jack pine.	Eastern white pine	---
59---------- Lisbon	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
67---------- Harpster	---	Tatarian honeysuckle, nannyberry viburnum, Washington hawthorn.	White spruce, northern white-cedar, eastern redcedar, green ash, Osageorange.	Black willow------	---
68---------- Sable	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
74---------- Radford	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
77---------- Huntsville	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
87B---------- Dickinson	Siberian peashrub	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn olive, Amur honeysuckle, lilac, Tatarian honeysuckle.	Eastern white pine, Austrian pine, red pine, jack pine.	---	---
92A---------- Sarpy	---	Tatarian honeysuckle, Siberian peashrub.	Osageorange, northern white-cedar, white spruce, nannyberry viburnum, eastern redcedar, Washington hawthorn, green ash.	Black willow------	Eastern cottonwood.
104---------- Virgil	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine.
107---------- Sawmill	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
119D2, 119E------- Elco	---	Silky dogwood, honeysuckle, Amur privet, American cranberrybush.	Northern white-cedar, Washington hawthorn, blue spruce, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
131D2---------- Alvin	---	Amur privet, Washington hawthorn, Amur honeysuckle, American cranberrybush, Tatarian honeysuckle.	Austrian pine, northern white-cedar, Osageorange, eastern redcedar.	Eastern white pine, red pine, Norway spruce.	---
132---------- Starks	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
134B, 134C2, 134D2---------- Camden	---	Amur honeysuckle, Amur privet, silky dogwood, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
145B2, 145C2------ Saybrook	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar.	Norway spruce, Austrian pine, Washington hawthorn.	Eastern white pine, pin oak.
148B, 148C2------- Proctor	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
149---------- Brenton	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
152---------- Drummer	---	American cranberrybush, Amur honeysuckle, silky dogwood, Amur privet.	Norway spruce, Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine.	Eastern white pine	Pin oak.
171B2, 171C2------ Catlin	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
198---------- Elburn	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, northern white-cedar, Washington hawthorn, blue spruce.	Norway spruce-----	Eastern white pine, pin oak.
199B---------- Plano	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
210. Lena					
224D3---------- Strawn	---	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
224E. Strawn					
239---------- Dorchester	---	Tatarian honeysuckle, Siberian peashrub.	Green ash, Osageorange, eastern redcedar, northern white-cedar, white spruce, nannyberry viburnum, Washington hawthorn.	Black willow, golden willow.	Eastern cottonwood.
243B, 243C2------- St. Charles	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
257---------- Clarksdale	---	American cranberrybush, Amur honeysuckle, silky dogwood, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian pine.	Norway spruce-----	Eastern white pine, pin oak.
259C2, 259D2------ Assumption	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
279B, 279C2------- Rozetta	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
280C2, 280D2, 280E---------- Fayette	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
282F---------- Chute	Siberian peashrub	Autumn olive, eastern redcedar, radiant crabapple, Washington hawthorn, Amur honeysuckle, lilac, Tatarian honeysuckle.	Austrian pine, jack pine, red pine.	Eastern white pine	---

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
290A---------- Warsaw	Siberian peashrub	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn olive, Amur honeysuckle, lilac, Tatarian honeysuckle.	Eastern white pine, Austrian pine, red pine, jack pine.	---	---
304B---------- Landes	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
330---------- Peotone	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
344B---------- Harvard	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
386B---------- Downs	---	American cranberrybush, Amur honeysuckle, autumn olive, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
404---------- Titus	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
406---------- Paxico	---	Silky dogwood, Amur privet, American cranberrybush.	Blue spruce, Washington hawthorn, white fir, northern white-cedar, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine.
415---------- Orion	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
439B---------- Jasper	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
451---------- Lawson	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
533*. Urban land					
536*. Dumps					
549C2---------- Marseilles	---	Amur privet, American cranberrybush, silky dogwood, Amur honeysuckle.	Blue spruce, Washington hawthorn, northern white-cedar, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine.
549E, 549G-------- Marseilles	---	Amur privet, American cranberrybush, silky dogwood, Amur honeysuckle.	Blue spruce, Washington hawthorn, northern white-cedar, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine.
567B2, 567C2------ Elkhart	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
709A, 709B2. Osceola					
857G*: Strawn.					
Hennepin---------	Siberian peashrub, Tatarian honeysuckle.	Eastern redcedar, Osageorange, Russian olive, jack pine, Washington hawthorn, silky dogwood, Amur privet, American cranberrybush.	Honeylocust, northern catalpa.	---	---
864*, 865*. Pits					

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
871B, 871D, 871G--Lenzburg	Siberian peashrub	Eastern redcedar, jack pine, Russian olive, Washington hawthorn, Osageorange.	Honeylocust, northern catalpa.	---	---
872B, 872C--------Rapatee	Tatarian honeysuckle, Siberian peashrub.	Eastern redcedar, jack pine, Washington hawthorn, Osageorange, Russian olive.	Honeylocust, northern catalpa.	---	---
2017*:					
Keomah-----------	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
Urban land.					
2036B*:					
Tama-------------	---	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.					
2224D*:					
Strawn-----------	---	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.					
2279B*:					
Rozetta----------	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.					
2290A*:					
Warsaw-----------	Siberian peashrub	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn olive, Amur honeysuckle, lilac, Tatarian honeysuckle.	Eastern white pine, Austrian pine, red pine, jack pine.	---	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
2290A*: Urban land.					
2439B*: Jasper	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
Urban land.					
2802B*: Orthents.					
Urban land.					
3070 Beaucoup	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
3406 Paxico	---	Silky dogwood, Amur privet, American cranberrybush.	Blue spruce, Washington hawthorn, white fir, northern white-cedar, Austrian pine.	Norway spruce	Pin oak, eastern white pine.
7070 Beaucoup	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
8D Hickory	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
8E Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
8G Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
16 Rushville	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
17 Keomah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
19C3 Sylvan	Slight	Slight	Severe: slope.	Slight	Slight.
19D3 Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
19E3 Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
24C2 Dodge	Slight	Slight	Severe: slope.	Slight	Slight.
24D Dodge	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
28 Jules	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
36B Tama	Slight	Slight	Moderate: slope.	Slight	Slight.
36C2 Tama	Slight	Slight	Severe: slope.	Slight	Slight.
37B Worthen	Slight	Slight	Moderate: slope.	Slight	Slight.
43 Ipava	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
45 Denny	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
54B Plainfield	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
54D Plainfield	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
59---------- Lisbon	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
67---------- Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
68---------- Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
74---------- Radford	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
77---------- Huntsville	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
87B---------- Dickinson	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
92A---------- Sarpy	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
104---------- Virgil	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
107---------- Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
119D2---------- Elco	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
119E---------- Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
131D2---------- Alvin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: droughty, slope.
132---------- Starks	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
134B---------- Camden	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
134C2---------- Camden	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
134D2---------- Camden	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
145B2---------- Saybrook	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
145C2---------- Saybrook	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
148B---------- Proctor	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
148C2 Proctor	Slight	Slight	Severe: slope.	Slight	Slight.
149 Brenton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
152 Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
171B2 Catlin	Slight	Slight	Moderate: slope.	Slight	Slight.
171C2 Catlin	Slight	Slight	Severe: slope.	Slight	Slight.
198 Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
199B Plano	Slight	Slight	Moderate: slope.	Slight	Slight.
210 Lena	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
224D3 Strawn	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
224E Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
239 Dorchester	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
243B St. Charles	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
243C2 St. Charles	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
257 Clarksdale	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
259C2 Assumption	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
259D2 Assumption	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
279B Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
279C2 Rozetta	Slight	Slight	Severe: slope.	Slight	Slight.
280C2 Fayette	Slight	Slight	Severe: slope.	Slight	Slight.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
280D2--Fayette	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
280E--Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
282F--Chute	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
290A--Warsaw	Slight	Slight	Moderate: small stones.	Slight	Slight.
304B--Landes	Severe: flooding.	Slight	Moderate: slope.	Slight	Moderate: flooding.
330--Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
344B--Harvard	Slight	Slight	Moderate: slope.	Slight	Slight.
386B--Downs	Slight	Slight	Moderate: slope.	Slight	Slight.
404--Titus	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
406--Paxico	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
415--Orion	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
439B--Jasper	Slight	Slight	Moderate: slope.	Slight	Slight.
451--Lawson	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
533*. Urban land					
536*. Dumps					
549C2--Marseilles	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, depth to rock.
549E--Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
549G--Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
567B2--Elkhart	Slight	Slight	Moderate: slope.	Slight	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
567C2---------- Elkhart	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
709A, 709B2---------- Osceola	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
857G*:					
Strawn----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Hennepin----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
864*, 865*. Pits					
871B---------- Lenzburg	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.		Moderate: large stones.
871D---------- Lenzburg	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.		Moderate: large stones, slope.
871G---------- Lenzburg	Severe: slope.	Severe: slope.	Severe: slope.		Severe: slope.
872B---------- Rapatee	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
872C---------- Rapatee	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: droughty, slope.
2017*:					
Keomah----------	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight----------	Slight.
Urban land.					
2036B*:					
Tama----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
Urban land.					
2224D*:					
Strawn----------	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Urban land.					
2279B*:					
Rozetta----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2279B*: Urban land.					
2290A*: Warsaw	Slight	Slight	Moderate: small stones.	Slight	Slight.
Urban land.					
2439B*: Jasper	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
2802B*: Orthents.					
Urban land.					
3070 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3406 Paxico	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
7070 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
8D---------- Hickory	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
8E---------- Hickory	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
8G---------- Hickory	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
16---------- Rushville	Poor	Fair	Poor	Fair	Good	Good	Poor	Fair	Good.
17---------- Keomah	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair.
19C3---------- Sylvan	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
19D3---------- Sylvan	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
19E3---------- Sylvan	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
24C2---------- Dodge	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
24D---------- Dodge	Poor	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
28---------- Jules	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
36B---------- Tama	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
36C2---------- Tama	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
37B---------- Worthen	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
43---------- Ipava	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
45---------- Denny	Good	Good	Good	Fair	Good	Good	Good	Fair	Good.
54B---------- Plainfield	Poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
54D---------- Plainfield	Very poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
59---------- Lisbon	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
67---------- Harpster	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Fair.
68---------- Sable	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
74---------- Radford	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
77---------- Huntsville	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
87B---------- Dickinson	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
92A---------- Sarpy	Poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
104---------- Virgil	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
107---------- Sawmill	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
119D2---------- Elco	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
119E---------- Elco	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
131D2---------- Alvin	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
132---------- Starks	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
134B---------- Camden	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
134C2---------- Camden	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Poor.
134D2---------- Camden	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Poor.
145B2---------- Saybrook	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
145C2---------- Saybrook	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
148B, 148C2-------- Proctor	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
149---------- Brenton	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
152---------- Drummer	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
171B2---------- Catlin	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
171C2---------- Catlin	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
198---------- Elburn	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
199B---------- Plano	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
210---------- Lena	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
224D3---------- Strawn	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
224E---------- Strawn	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
239---------- Dorchester	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Poor	Poor.
243B---------- St. Charles	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
243C2---------- St. Charles	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
257---------- Clarksdale	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
259C2, 259D2------- Assumption	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
279B---------- Rozetta	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
279C2---------- Rozetta	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
280C2, 280D2------- Fayette	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
280E---------- Fayette	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
282F---------- Chute	Poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Poor	Very poor.
290A---------- Warsaw	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
304B---------- Landes	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
330---------- Peotone	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
344B---------- Harvard	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
386B---------- Downs	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
404---------- Titus	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
406---------- Paxico	Poor	Fair	Fair	Good	Good	Good	Fair	Good	Fair.
415---------- Orion	Good	Good	Good	Good	Good	Fair	Good	Good	Good.
439B---------- Jasper	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
451---------- Lawson	Good	Good	Fair	Good	Fair	Fair	Good	Good	Fair.
533*. Urban land									
536*. Dumps									
549C2---------- Marseilles	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
549E, 549G--------- Marseilles	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
567B2, 567C2------- Elkhart	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
709A, 709B2-------- Osceola	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
857G*:									
Strawn----------	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Hennepin----------	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
864*, 865*. Pits									
871B---------- Lenzburg	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
871D---------- Lenzburg	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
871G---------- Lenzburg	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
872B---------- Rapatee	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
872C---------- Rapatee	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
2017*:									
Keomah	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair.
Urban land.									
2036B*:									
Tama	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.									
2224D*:									
Strawn	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Urban land.									
2279B*:									
Rozetta	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Urban land.									
2290A*:									
Warsaw	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Urban land.									
2439B*:									
Jasper	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Urban land.									
2802B*:									
Orthents.									
Urban land.									
3070 Beaucoup	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3406 Paxico	Poor	Fair	Fair	Good	Good	Good	Fair	Good	Fair.
7070 Beaucoup	Good	Good	Good	Fair	Good	Good	Good	Fair	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
8D---------- Hickory	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
8E, 8G---------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
16---------- Rushville	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
17---------- Keomah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, frost action, low strength.	Slight.
19C3---------- Sylvan	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Severe: low strength, frost action.	Slight.
19D3---------- Sylvan	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
19E3---------- Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
24C2---------- Dodge	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
24D---------- Dodge	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
28---------- Jules	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
36B---------- Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
36C2---------- Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
37B---------- Worthen	Slight---------	Slight---------	Slight---------	Slight---------	Severe: low strength, frost action.	Slight.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
43---------- Ipava	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
45---------- Denny	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
54B---------- Plainfield	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
54D---------- Plainfield	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
59---------- Lisbon	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
67---------- Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
68---------- Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
74---------- Radford	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
77---------- Huntsville	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: flooding.
87B---------- Dickinson	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
92A---------- Sarpy	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
104---------- Virgil	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
107---------- Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
119D2---------- Elco	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
119E---------- Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
131D2---------- Alvin	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: droughty, slope.
132---------- Starks	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
134B---------- Camden	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
134C2---------- Camden	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
134D2---------- Camden	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
145B2---------- Saybrook	Slight---------	Slight---------	Slight---------	Slight---------	Severe: low strength, frost action.	Slight.
145C2---------- Saybrook	Slight---------	Slight---------	Slight---------	Moderate: slope.	Severe: low strength, frost action.	Slight.
148B---------- Proctor	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
148C2---------- Proctor	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
149---------- Brenton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
152---------- Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
171B2---------- Catlin	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
171C2---------- Catlin	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
198---------- Elburn	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
199B---------- Plano	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
210---------- Lena	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: ponding, flooding, excess humus.
224D3---------- Strawn	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
224E---------- Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
239---------- Dorchester	Severe: excess humus.	Severe: flooding.	Severe: flooding, low strength.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
243B---------- St. Charles	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
243C2---------- St. Charles	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
257---------- Clarksdale	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
259C2---------- Assumption	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
259D2---------- Assumption	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
279B---------- Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
279C2---------- Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
280C2---------- Fayette	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
280D2---------- Fayette	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
280E---------- Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
282F--- Chute	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
290A--- Warsaw	Severe: cutbanks cave.	Slight---	Slight---	Slight---	Moderate: frost action.	Slight.
304B--- Landes	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Moderate: flooding.
330--- Peotone	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
344B--- Harvard	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
386B--- Downs	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
404--- Titus	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
406--- Paxico	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
415--- Orion	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Severe: flooding.
439B--- Jasper	Severe: cutbanks cave.	Slight---	Slight---	Slight---	Moderate: frost action.	Slight.
451--- Lawson	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
533*. Urban land						
536*. Dumps						
549C2--- Marseilles	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Moderate: wetness, depth to rock.
549E, 549G--- Marseilles	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
567B2--- Elkhart	Moderate: cutbanks cave, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
567C2--- Elkhart	Moderate: cutbanks cave, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
709A, 709B2. Osceola						
857G*: Strawn---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Hennepin---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
864*, 865*. Pits						
871B--- Lenzburg	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: large stones.
871D--- Lenzburg	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
871G--- Lenzburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
872B--- Rapatee	Moderate: dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
872C--- Rapatee	Moderate: dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: droughty, slope.
2017*: Keomah---	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, frost action, low strength.	Slight.
Urban land.						
2036B*: Tama---	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
Urban land.						
2224D*: Strawn---	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2224D*:						
Urban land.						
2279B*:						
Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
Urban land.						
2290A*:						
Warsaw	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
Urban land.						
2439B*:						
Jasper	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Urban land.						
2802B*:						
Orthents.						
Urban land.						
3070 Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3406 Paxico	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
7070 Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding.	Severe: ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
8D Hickory	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
8E, 8G Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
16 Rushville	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
17 Keomah	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
19C3 Sylvan	Moderate: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Good.
19D3 Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
19E3 Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
24C2 Dodge	Moderate: percs slowly.	Severe: slope.	Slight	Slight	Fair: small stones.
24D Dodge	Moderate: slope, percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
28 Jules	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
36B Tama	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
36C2 Tama	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
37B Worthen	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
43 Ipava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
45 Denny	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
54B Plainfield	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
54D Plainfield	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
59 Lisbon	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
67 Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
68 Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
74 Radford	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
77 Huntsville	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
87B Dickinson	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
92A Sarpy	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
104 Virgil	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
107 Sawmill	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
119D2 Elco	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
119E Elco	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Poor: slope.
131D2 Alvin	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
132 Starks	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
134B---------- Camden	Slight----------	Moderate: seepage, slope.	Severe: seepage.	Slight----------	Fair: too clayey.
134C2---------- Camden	Slight----------	Severe: slope.	Severe: seepage.	Slight----------	Fair: too clayey.
134D2---------- Camden	Moderate: slope.	Severe: slope.	Severe: seepage.	Moderate: slope.	Fair: slope, too clayey.
145B2---------- Saybrook	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
145C2---------- Saybrook	Moderate: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
148B---------- Proctor	Moderate: percs slowly.	Severe: seepage.	Severe: seepage, too sandy.	Slight----------	Poor: too sandy.
148C2---------- Proctor	Moderate: percs slowly.	Severe: seepage, slope.	Severe: seepage, too sandy.	Slight----------	Poor: too sandy.
149---------- Brenton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
152---------- Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
171B2---------- Catlin	Severe: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
171C2---------- Catlin	Severe: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
198---------- Elburn	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
199B---------- Plano	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
210---------- Lena	Severe: subsides, flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
224D3---------- Strawn	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
224E---------- Strawn	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
239---------- Dorchester	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Poor: thin layer.
243B---------- St. Charles	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
243C2---------- St. Charles	Moderate: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
257---------- Clarksdale	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
259C2---------- Assumption	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.
259D2---------- Assumption	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey.
279B---------- Rozetta	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
279C2---------- Rozetta	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
280C2---------- Fayette	Slight----------	Severe: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
280D2---------- Fayette	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, too clayey.
280E---------- Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
282F---------- Chute	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
290A---------- Warsaw	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
304B---------- Landes	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
330---------- Peotone	Severe: ponding, percs slowly.	Slight----------	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
344B---------- Harvard	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight----------	Fair: too clayey, thin layer.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
386B---------- Downs	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
404---------- Titus	Severe: ponding, percs slowly.	Slight----------	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
406---------- Paxico	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
415---------- Orion	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
439B---------- Jasper	Slight----------	Severe: seepage.	Severe: seepage.	Slight----------	Fair: too clayey, thin layer.
451---------- Lawson	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
533*. Urban land					
536*. Dumps					
549C2---------- Marseilles	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, slope, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock.	Poor: depth to rock.
549E, 549G---------- Marseilles	Severe: thin layer, seepage, wetness.	Severe: seepage, slope, wetness.	Severe: seepage, wetness, slope.	Severe: slope.	Poor: area reclaim, slope, thin layer.
567B2---------- Elkhart	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
567C2---------- Elkhart	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
709A, 709B2. Osceola					
857G*: Strawn----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Hennepin----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
864*, 865*. Pits					
871B---------- Lenzburg	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, small stones.
871D---------- Lenzburg	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
871G---------- Lenzburg	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
872B---------- Rapatee	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, small stones.
872C---------- Rapatee	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
2017*: Keomah----------	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Urban land.					
2036B*: Tama----------	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
Urban land.					
2224D*: Strawn----------	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
Urban land.					
2279B*: Rozetta----------	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
Urban land.					
2290A*: Warsaw----------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2290A*: Urban land.					
2439B*: Jasper	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey, thin layer.
Urban land.					
2802B*: Orthents.					
Urban land.					
3070 Beaucoup	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3406 Paxico	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
7070 Beaucoup	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
8D Hickory	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
8E Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
8G Hickory	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
16 Rushville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
17 Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
19C3 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
19D3 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
19E3 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
24C2 Dodge	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
24D Dodge	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, area reclaim, small stones.
28 Jules	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
36B, 36C2 Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
37B Worthen	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
43 Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
45 Denny	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
54B, 54D Plainfield	Good	Probable	Improbable: too sandy.	Poor: too sandy.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
59--Lisbon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
67--Harpster	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
68--Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
74--Radford	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
77--Huntsville	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
87B--Dickinson	Good	Probable	Improbable: too sandy.	Good.
92A--Sarpy	Good	Probable	Improbable: too sandy.	Poor: too sandy.
104--Virgil	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
107--Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
119D2--Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
119E--Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
131D2--Alvin	Good	Probable	Improbable: too sandy.	Poor: too sandy.
132--Starks	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
134B, 134C2--Camden	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
134D2--Camden	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
145B2, 145C2--Saybrook	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
148B, 148C2--Proctor	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
149--Brenton	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
152--Drummer	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
171B2, 171C2--Catlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
198 Elburn	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
199B Plano	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
210 Lena	Poor: wetness, low strength.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
224D3 Strawn	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
224E Strawn	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
239 Dorchester	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
243B, 243C2 St. Charles	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, area reclaim.
257 Clarksdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
259C2 Assumption	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
259D2 Assumption	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer, slope.
279B, 279C2 Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
280C2 Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
280D2 Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
280E Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
282F Chute	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
290A Warsaw	Good	Probable	Probable	Poor: small stones, area reclaim.
304B Landes	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones, thin layer.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
330---------- Peotone	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
344B---------- Harvard	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
386B---------- Downs	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
404---------- Titus	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
406---------- Paxico	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
415---------- Orion	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
439B---------- Jasper	Good----------	Probable----------	Improbable: too sandy.	Good.
451---------- Lawson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
533*. Urban land				
536*. Dumps				
549C2---------- Marseilles	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey.
549E---------- Marseilles	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
549G---------- Marseilles	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
567B2, 567C2---------- Elkhart	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
709A, 709B2. Osceola				
857G*: Strawn----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
857G*:				
Hennepin	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
864*, 865*. Pits				
871B, 871D---------- Lenzburg	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
871G---------- Lenzburg	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
872B, 872C---------- Rapatee	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
2017*:				
Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Urban land.				
2036B*:				
Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2224D*:				
Strawn	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Urban land.				
2279B*:				
Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Urban land.				
2290A*:				
Warsaw	Good----------	Probable----------	Probable----------	Poor: small stones, area reclaim.
Urban land.				
2439B*:				
Jasper	Good----------	Probable----------	Improbable: too sandy.	Good.
Urban land.				
2802B*:				
Orthents.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2802B*: Urban land.				
3070---------- Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3406---------- Paxico	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
7070---------- Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
8D, 8E, 8G-------- Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
16---------- Rushville	Slight---------	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
17---------- Keomah	Slight---------	Severe: hard to pack.	Frost action, percs slowly.	Wetness, percs slowly.	Wetness, erodes easily, percs slowly.	Erodes easily, percs slowly.
19C3---------- Sylvan	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
19D3, 19E3-------- Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
24C2---------- Dodge	Moderate: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
24D---------- Dodge	Severe: slope.	Severe: seepage, piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
28---------- Jules	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
36B, 36C2--------- Tama	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.
37B---------- Worthen	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
43---------- Ipava	Slight---------	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
45---------- Denny	Slight---------	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding.	Wetness, erodes easily, percs slowly.
54B---------- Plainfield	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
54D---------- Plainfield	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
59---------- Lisbon	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
67---------- Harpster	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
68---------- Sable	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
74---------- Radford	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness--------	Wetness.
77---------- Huntsville	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Flooding-------	Favorable------	Favorable.
87B---------- Dickinson	Severe: seepage.	Severe: seepage.	Deep to water	Soil blowing---	Too sandy, soil blowing.	Favorable.
92A---------- Sarpy	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
104---------- Virgil	Severe: seepage.	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
107---------- Sawmill	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness--------	Wetness.
119D2, 119E------- Elco	Severe: slope.	Moderate: piping, wetness.	Frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily.
131D2---------- Alvin	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Slope, soil blowing.	Slope, droughty, rooting depth.
132---------- Starks	Moderate: seepage.	Severe: thin layer, wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
134B, 134C2------- Camden	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
134D2---------- Camden	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
145B2, 145C2------ Saybrook	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
148B, 148C2------- Proctor	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Erodes easily, too sandy.	Erodes easily.
149---------- Brenton	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness--------	Wetness--------	Wetness.
152---------- Drummer	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
171B2, 171C2------ Catlin	Moderate: seepage, slope.	Moderate: wetness.	Deep to water	Slope----------	Erodes easily	Erodes easily.
198---------- Elburn	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
199B---------- Plano	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
210---------- Lena	Severe: seepage.	Severe: excess humus, ponding.	Ponding, flooding, subsides.	Ponding, soil blowing, flooding.	Ponding, soil blowing.	Wetness.
224D3, 224E------- Strawn	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
239---------- Dorchester	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
243B, 243C2------- St. Charles	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
257---------- Clarksdale	Slight---------	Severe: wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
259C2---------- Assumption	Moderate: seepage, slope.	Moderate: wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
259D2---------- Assumption	Severe: slope.	Moderate: wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
279B, 279C2------- Rozetta	Moderate: seepage, slope.	Slight---------	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
280C2---------- Fayette	Moderate: slope, seepage.	Slight---------	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
280D2, 280E------- Fayette	Severe: slope.	Slight---------	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
282F---------- Chute	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
290A---------- Warsaw	Severe: seepage.	Severe: seepage.	Deep to water	Favorable------	Too sandy------	Favorable.
304B---------- Landes	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope----------	Too sandy------	Favorable.
330---------- Peotone	Slight---------	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
344B---------- Harvard	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
386B---------- Downs	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
404---------- Titus	Slight---------	Severe: ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, rooting depth, percs slowly.
406---------- Paxico	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
415---------- Orion	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
439B---------- Jasper	Severe: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
451---------- Lawson	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
533*. Urban land						
536*. Dumps						
549C2---------- Marseilles	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Percs slowly, depth to rock, frost action.	Slope, wetness, percs slowly.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
549E, 549G-------- Marseilles	Severe: slope.	Severe: thin layer.	Percs slowly, thin layer, frost action.	Slope, wetness, percs slowly.	Slope, area reclaim, erodes easily.	Slope, erodes easily, area reclaim.
567B2, 567C2------ Elkhart	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
709A, 709B. Osceola						
857G*:						
Strawn----------	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Hennepin---------	Severe: slope.	Severe: piping.	Deep to water	Slope, rooting depth.	Slope----------	Slope, rooting depth.
864*, 865*. Pits						
871B---------- Lenzburg	Moderate: slope.	Moderate: piping.	Deep to water		Erodes easily	Erodes easily.
871D, 871G-------- Lenzburg	Severe: slope.	Moderate: piping.	Deep to water		Slope, erodes easily.	Slope, erodes easily.
872B---------- Rapatee	Moderate: slope.	Severe: piping.	Deep to water	Slope, percs slowly.	Erodes easily, percs slowly.	Erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
872C---------- Rapatee	Severe: slope.	Severe: piping.	Deep to water	Slope, droughty, percs slowly.	Slope, erodes easily, percs slowly.	Slope, erodes easily, droughty.
2017*:						
Keomah----------	Slight---------	Severe: hard to pack.	Frost action, percs slowly.	Wetness, percs slowly.	Wetness, erodes easily, percs slowly.	Erodes easily, percs slowly.
Urban land.						
2036B*:						
Tama----------	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.
Urban land.						
2224D*:						
Strawn----------	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Urban land.						
2279B*:						
Rozetta----------	Moderate: seepage, slope.	Slight---------	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Urban land.						
2290A*:						
Warsaw----------	Severe: seepage.	Severe: seepage.	Deep to water	Favorable------	Too sandy------	Favorable.
Urban land.						
2439B*:						
Jasper----------	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
Urban land.						
2802B*:						
Orthents.						
Urban land.						
3070---------- Beaucoup	Slight---------	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding--------	Wetness.
3406---------- Paxico	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
7070---------- Beaucoup	Slight---------	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
8D, 8E---------- Hickory	0-7	Silt loam--------	CL, ML, CL-ML	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	7-45	Clay loam, silt loam, gravelly clay loam.	CL	A-6, A-7	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	45-60	Sandy loam, loam, clay loam.	CL-ML, CL	A-4, A-6	0-5	85-100	75-95	70-95	60-80	20-40	5-20
8G---------- Hickory	0-7	Loam----------	CL, ML, CL-ML	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	7-45	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	45-60	Sandy loam, loam, gravelly clay loam.	CL-ML, CL	A-4, A-6	0-5	85-100	75-95	70-95	60-80	20-40	5-20
16---------- Rushville	0-10	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0	100	100	95-100	90-100	25-40	NP-15
	10-15	Silt loam, silt	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-40	NP-15
	15-33	Silty clay loam, silty clay.	CH, CL	A-7-6	0	100	100	95-100	95-100	45-60	20-35
	33-50	Silty clay loam, silty clay.	CH, CL, ML, MH	A-7-6	0	100	100	95-100	95-100	45-60	15-30
	50-60	Silt loam, silty clay loam.	CL	A-4, A-6, A-7-6	0	100	100	95-100	90-100	30-45	8-20
17---------- Keomah	0-20	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	20-46	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	100	95-100	45-60	30-45
	46-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	100	95-100	35-50	15-30
19C3, 19D3, 19E3- Sylvan	0-7	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-50	20-30
	7-23	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	23-60	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
24C2, 24D-------- Dodge	0-12	Silt loam--------	CL, CL-ML, ML	A-4	0	100	100	90-100	85-95	20-30	3-10
	12-27	Silty clay loam, silt loam.	CL, CH	A-6, A-7	0	100	100	90-100	85-95	35-55	15-32
	27-32	Clay loam, sandy clay loam, sandy loam.	CL, SC	A-6, A-7, A-2, A-4	0-2	90-100	85-100	50-100	25-80	25-45	8-25
	32-60	Gravelly loam, gravelly sandy loam, loam.	ML, CL, SM, SC	A-2, A-4, A-1	0-3	75-95	65-95	35-95	15-75	15-30	NP-10
28---------- Jules	0-8	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	8-60	Stratified silt loam to loamy fine sand.	ML	A-4	0	100	100	90-100	80-100	27-36	4-10

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
36B, 36C2	0-16	Silt loam	ML, CL	A-6, A-7	0	100	100	100	95-100	35-45	10-20
Tama	16-43	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	15-25
	43-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
37B	0-25	Silt loam	CL	A-4, A-6	0	100	100	95-100	80-100	25-40	7-21
Worthen	25-60	Silt loam	CL	A-4, A-6	0	100	100	95-100	80-100	25-40	7-21
43	0-19	Silt loam	ML, CL	A-6	0	100	100	95-100	90-100	25-40	10-20
Ipava	19-51	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-70	25-40
	51-60	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	95-100	90-100	25-40	5-20
45	0-9	Silt loam	CL	A-6, A-4	0	100	100	95-100	95-100	30-40	8-15
Denny	9-21	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	25-40	5-15
	21-47	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	95-100	95-100	35-60	15-35
	47-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	25-40	11-20
54B, 54D	0-8	Loamy sand	SM, SP-SM	A-2, A-4, A-1	0	75-100	75-100	40-90	12-40	---	NP
Plainfield	8-31	Sand	SP, SM, SP-SM	A-3, A-1, A-2	0	75-100	75-100	40-75	1-15	---	NP
	31-60	Sand, fine sand	SP, SM, SP-SM	A-3, A-1, A-2	0	75-100	75-100	40-90	1-15	---	NP
59	0-8	Silt loam	ML	A-6, A-7	0	100	100	95-100	80-95	35-50	10-20
Lisbon	8-34	Silty clay loam, silt loam.	CL, CH	A-7, A-6	0	100	95-100	95-100	80-98	35-55	15-35
	34-41	Loam, clay loam, silty clay loam.	CL	A-4, A-6, A-7	0-5	90-100	90-100	85-100	70-85	20-45	8-25
	41-60	Loam, silt loam	CL	A-6, A-4	0-3	90-100	90-100	85-100	70-85	20-40	8-20
67	0-16	Silty clay loam	CL, CH	A-7	0	100	95-100	95-100	90-100	45-60	20-35
Harpster	16-45	Silty clay loam	CL, CH	A-7	0	100	95-100	95-100	85-100	40-60	20-35
	45-60	Silty clay loam, silt loam, loam.	CL, CH	A-6, A-7	0	100	95-100	95-100	70-100	35-55	20-35
68	0-17	Silty clay loam	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
Sable	17-46	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-35
	46-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
74	0-15	Silt loam	ML, CL	A-4, A-6	0	100	100	95-100	80-100	30-40	5-15
Radford	15-24	Silt loam	CL, ML	A-4, A-6	0	100	100	95-100	80-100	25-35	5-15
	24-60	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7	0	100	100	95-100	80-95	35-50	15-25
77	0-28	Silt loam	CL	A-6	0	100	95-100	90-100	85-100	25-40	10-20
Huntsville	28-38	Silt loam	CL	A-6	0	100	95-100	90-100	85-100	20-35	10-20
	38-60	Silt loam, loam, very fine sandy loam.	CL-ML, CL, SM-SC, SC	A-4, A-6, A-2	0	95-100	90-100	85-95	30-85	20-35	5-20

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
87B---------- Dickinson	0-9	Sandy loam-------	SM, SC, SM-SC	A-4, A-2	0	100	100	85-95	30-50	15-30	NP-10
	9-24	Fine sandy loam, sandy loam.	SM, SC, SM-SC	A-4	0	100	100	85-95	35-50	15-30	NP-10
	24-31	Loamy sand, loamy fine sand, fine sand.	SM, SP-SM, SM-SC	A-2, A-3	0	100	100	80-95	5-20	10-20	NP-5
	31-60	Sand, loamy fine sand, loamy sand.	SM, SP-SM	A-3, A-2	0	100	100	70-90	5-20	---	NP
92A---------- Sarpy	0-4	Loamy sand-------	SM	A-2-4	0	100	100	60-80	15-35	---	NP
	4-60	Fine sand, loamy fine sand, sand.	SM, SP, SP-SM	A-2-4, A-3	0	100	100	60-80	2-35	---	NP
104---------- Virgil	0-9	Silt loam--------	CL	A-4, A-6	0	100	100	90-100	85-95	20-35	8-20
	9-14	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-95	20-35	5-20
	14-50	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	15-30
	50-60	Loam, sandy loam, clay loam.	CL, SC, SM-SC, CL-ML	A-6, A-4, A-2-4, A-2-6	0-5	90-100	85-100	70-100	30-90	20-35	5-15
107---------- Sawmill	0-16	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-50	15-30
	16-33	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-50	15-30
	33-50	Silty clay loam, clay loam, loam.	CL	A-6, A-7, A-4	0	100	100	85-100	70-95	25-50	8-25
	50-60	Stratified clay loam to silt loam.	CL	A-4, A-6, A-7	0	100	100	75-100	65-95	20-50	8-30
119D2, 119E------ Elco	0-9	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	9-27	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	10-30
	27-60	Silty clay loam, loam, clay.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	10-30
131D2---------- Alvin	0-7	Fine sandy loam	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
	7-14	Fine sandy loam, sandy loam, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	80-95	30-60	<25	NP-4
	14-47	Fine sandy loam, sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	90-100	20-80	15-40	NP-15
	47-60	Loamy fine sand, sandy loam, fine sand.	SP, SP-SM, SM	A-2, A-3	0	95-100	90-100	70-95	4-35	<20	NP-4
132---------- Starks	0-13	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	20-35	4-15
	13-26	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	80-100	35-45	15-25
	26-44	Loam, silty clay loam, clay loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0	95-100	90-100	80-95	40-80	25-40	6-17
	44-60	Stratified loamy sand to clay loam.	SM, SC, ML, CL	A-2, A-4, A-6	0-5	90-100	80-95	40-90	30-60	<30	NP-15

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
134B, 134C2, 134D2---------- Camden	0-8	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0	100	100	95-100	90-100	20-35	3-15
	8-34	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	90-100	25-40	15-25
	34-43	Sandy clay loam, sandy loam, clay loam.	ML, SC, SM, CL	A-2, A-4, A-6	0-5	90-100	85-100	60-100	30-70	20-40	3-15
	43-60	Stratified sandy loam to silt loam.	SM, SC, ML, CL	A-2, A-4	0-5	90-100	80-100	50-80	20-60	<25	3-10
145B2, 145C2----- Saybrook	0-8	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	95-100	90-100	25-40	5-20
	8-23	Silt loam, silty clay loam.	CL, CH	A-6, A-7	0	100	100	90-100	85-100	35-55	15-30
	23-60	Clay loam, loam, silt loam.	CL	A-6, A-4	0	95-100	85-100	80-95	60-85	20-40	8-25
148B, 148C2------ Proctor	0-11	Silt loam--------	CL	A-6	0	100	100	95-100	85-100	25-40	10-20
	11-28	Silty clay loam	CL	A-7, A-6	0	95-100	90-100	85-100	85-100	25-50	10-25
	28-33	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	90-100	85-100	75-100	65-80	25-45	10-25
	33-60	Stratified loam to loamy sand.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	0	85-100	80-100	50-100	25-80	20-40	5-20
149---------- Brenton	0-16	Silt loam--------	CL, ML	A-6, A-4	0	100	95-100	95-100	85-100	30-40	8-15
	16-29	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	100	95-100	95-100	85-100	35-50	10-25
	29-60	Stratified loam to silty clay loam.	CL-ML, CL, SM-SC, SC	A-2, A-4, A-6	0	95-100	85-100	80-100	30-85	20-35	5-20
152---------- Drummer	0-17	Silty clay loam	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	17-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	46-60	Stratified loamy sand to silty clay loam.	SC, CL	A-4, A-6	0-5	95-100	85-95	75-95	45-80	20-35	7-20
171B2, 171C2----- Catlin	0-10	Silt loam--------	ML, CL, CL-ML	A-6, A-7	0	100	100	95-100	85-100	25-45	10-20
	10-43	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	90-100	90-100	80-100	35-50	20-30
	43-60	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0	90-100	90-100	85-100	60-100	25-45	10-20
198---------- Elburn	0-18	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
	18-50	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	75-90	30-50	15-35
	50-60	Loam, sandy loam, clay loam.	CL, CL-ML, SC, SM-SC	A-6, A-4, A-2	0	90-100	80-100	60-90	25-80	20-40	5-20
199B---------- Plano	0-11	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-30	5-15
	11-42	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	95-100	25-40	10-25
	42-60	Stratified silt loam to loamy sand.	ML, SM, CL, SC	A-4, A-2	0-5	90-100	85-95	60-90	30-70	<25	NP-10

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
210--------- Lena	0-10	Sapric material	PT	A-8	0	---	---	---	---	---	---
	10-60	Sapric material	PT	A-8	0	---	---	---	---	---	---
224D3--------- Strawn	0-4	Silty clay loam	CL	A-6, A-7	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	4-20	Silty clay loam, clay loam.	CL	A-6, A-7	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	20-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-5	75-100	70-100	60-95	40-95	20-35	7-18
224E--------- Strawn	0-5	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0	95-100	95-100	90-100	90-100	20-40	3-20
	5-20	Silty clay loam, clay loam.	CL	A-6, A-7	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	20-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-5	75-100	70-100	60-95	40-95	20-35	7-18
239--------- Dorchester	0-32	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	95-100	90-95	25-35	5-10
	32-60	Silt loam, silty clay loam, clay loam.	OL, ML, CL	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
243B, 243C2------ St. Charles	0-12	Silt loam--------	CL, ML	A-4, A-6	0	100	100	95-100	95-100	22-35	6-15
	12-51	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	90-100	30-40	10-20
	51-60	Clay loam, silt loam, sandy loam.	CL, SC	A-4, A-6	0	90-100	75-100	75-95	40-80	20-35	8-20
257--------- Clarksdale	0-8	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	8-13	Silt loam--------	CL	A-6, A-4	0	100	100	95-100	90-100	20-35	8-18
	13-30	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-65	25-40
	30-60	Silt loam, silty clay loam.	CL	A-6	0	95-100	95-100	95-100	90-100	25-40	10-25
259C2, 259D2----- Assumption	0-15	Silt loam--------	CL, ML	A-6, A-4	0	100	100	95-100	90-100	25-40	8-20
	15-24	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-30
	24-60	Clay loam, silty clay loam, clay.	CL	A-6, A-7	0-5	100	95-100	90-100	70-90	35-50	20-35
279B, 279C2------ Rozetta	0-8	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	95-100	24-35	8-15
	8-13	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-30	5-15
	13-49	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	49-60	Silt loam--------	CL	A-6, A-4	0	100	100	95-100	85-100	25-40	7-20
280C2, 280D2, 280E---------- Fayette	0-9	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	9-52	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	52-60	Silt loam--------	CL	A-6	0	100	100	100	95-100	30-40	10-20
282F--------- Chute	0-11	Loamy fine sand	SM, SP-SM	A-2	0	100	100	70-85	10-35	---	NP
	11-60	Fine sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	95-100	70-95	5-25	---	NP

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
290A---------- Warsaw	0-16	Silt loam--------	CL, CL-ML	A-4, A-6	0	85-100	85-100	70-100	50-90	20-30	4-12
	16-20	Sandy clay loam, loam, clay loam.	SC, CL, CL-ML, SM-SC	A-6, A-2-6, A-4, A-2-4	0-3	90-100	85-100	60-90	30-70	20-35	6-15
	20-35	Gravelly sandy clay loam, gravelly clay loam.	CL, SC, GC, SM-SC	A-6, A-2-6, A-4, A-2-4	0-5	70-90	60-85	55-70	30-60	20-35	6-15
	35-60	Stratified sand to very gravelly coarse sand.	SP, GP, SP-SM, GP-GM	A-1	1-5	30-70	22-55	7-20	2-10	<20	NP
304B---------- Landes	0-13	Loam----------	CL, CL-ML	A-4, A-6	0	100	90-100	85-100	50-75	20-35	5-15
	13-38	Loam, fine sandy loam, loamy fine sand.	SM, CL-ML, SC, SM-SC	A-4, A-2-4	0	100	85-100	70-100	15-60	<25	NP-10
	38-60	Stratified sand to silt loam.	SM, SP-SM, SC, SM-SC	A-4, A-2-4	0	100	85-100	70-85	10-50	<30	NP-10
330---------- Peotone	0-19	Silty clay loam	CH, CL	A-7	0	100	95-100	95-100	80-100	40-65	15-35
	19-48	Silty clay loam, silty clay.	CH, CL	A-7	0-5	100	95-100	90-100	85-100	41-70	17-39
	48-60	Silty clay loam, silt loam, silty clay.	CL, CH, ML, MH	A-7, A-6	0-5	95-100	95-100	90-100	75-98	30-60	14-29
344B---------- Harvard	0-16	Silt loam--------	CL	A-4, A-6	0	100	95-100	90-100	85-100	30-40	8-15
	16-29	Silty clay loam, silt loam.	ML, CL	A-6, A-7	0	100	90-100	90-100	85-100	35-45	10-20
	29-35	Clay loam, loam, sandy loam.	ML, CL	A-4, A-6, A-7	0-3	95-100	85-95	75-90	55-85	30-45	5-20
	35-60	Stratified clay loam to sand.	SM, CL-ML, SM-SC, CL	A-2, A-4, A-6, A-7	0-5	90-100	80-95	40-90	15-70	20-45	NP-20
386B---------- Downs	0-9	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	9-44	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-45	15-25
	44-60	Silt loam--------	CL	A-6	0	100	100	100	95-100	30-40	11-20
404---------- Titus	0-12	Silty clay loam	CH, CL	A-7	0	100	100	95-100	90-100	40-55	20-30
	12-46	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	40-55	20-30
	46-60	Stratified silty clay loam to sand.	CL	A-6	0	100	90-100	70-90	20-75	20-40	10-25
406---------- Paxico	0-11	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-100	80-100	<30	4-10
	11-60	Silt loam--------	ML, CL-ML	A-4	0	100	100	90-100	90-100	<30	4-10
415---------- Orion	0-6	Silt loam--------	CL, CL-ML	A-4	0	100	100	85-100	80-100	20-30	4-10
	6-24	Silt loam to very fine sand.	CL, CL-ML	A-4	0	100	100	90-100	70-80	20-30	4-10
	24-42	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	85-100	85-100	20-40	4-18
	42-60	Stratified silt loam to sand.	CL, CL-ML	A-4	0	80-100	80-100	80-100	80-100	20-30	4-10
439B---------- Jasper	0-18	Loam----------	CL-ML, CL	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	18-40	Loam, clay loam, sandy clay loam.	CL-ML, CL, SM-SC, SC	A-4, A-6	0	100	100	60-100	35-85	20-35	5-20
	40-60	Loamy sand, sand	SM, SP-SM, SC, SM-SC	A-2-4, A-3	0	100	100	50-75	5-30	<25	NP-10

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
451----------	0-17	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	85-100	20-40	5-20
Lawson	17-35	Silt loam, silty clay loam.	CL, CL-ML	A-4	0	100	100	90-100	85-100	20-30	5-10
	35-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	90-100	60-100	20-45	10-25
533*.											
Urban land											
536*.											
Dumps											
549C2----------	0-11	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
Marseilles	11-28	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	90-100	85-100	35-50	15-25
	28-39	Clay loam, silty clay, silt loam.	CL, CH	A-7	0-1	100	95-100	85-100	80-100	40-60	15-30
	39-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
549E, 549G-------	0-10	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
Marseilles	10-26	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	90-100	85-100	35-50	15-25
	26-39	Clay loam, silty clay, silt loam.	CL, CH	A-7	0-5	100	95-100	85-100	80-100	40-60	15-30
	39-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
567B2, 567C2-----	0-8	Silty clay loam	CL	A-6, A-7	0	100	100	100	95-100	35-50	16-30
Elkhart	8-32	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	18-30
	32-60	Silt loam, silt	CL	A-6, A-4	0	100	100	95-100	95-100	20-37	8-20
709A, 709B2------	0-9	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	25-40	5-15
Osceola	9-15	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	25-35	5-15
	15-41	Silty clay, silty clay loam, silt loam.	CL, CH	A-6, A-7	0	100	100	95-100	95-100	35-55	15-30
	41-47	Sandy loam, loamy sand.	SM, ML	A-2, A-4	0	100	100	80-95	30-60	<25	NP-4
	47-52	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0-1	95-100	90-100	85-100	75-95	35-55	15-35
	52-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
857G*:											
Strawn----------	0-8	Loam-------------	CL, ML, CL-ML	A-4, A-6	0	95-100	95-100	90-100	60-100	20-40	3-20
	8-26	Silty clay loam, clay loam.	CL	A-6, A-7	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	26-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-5	75-100	70-100	60-95	40-95	20-35	7-18
Hennepin--------	0-4	Loam-------------	CL, CL-ML	A-4, A-6, A-7	0-5	90-100	85-100	70-100	60-95	25-45	5-20
	4-16	Loam, clay loam, silt loam.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0-5	85-100	75-100	65-100	35-95	20-50	5-25
	16-60	Loam, clay loam, silt loam.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0-5	85-100	75-100	65-100	35-95	20-50	5-25

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
864*, 865*. Pits											
871B, 871D, 871G-Lenzburg	0-3	Silt loam	CL, ML	A-6, A-4	2-10	80-100	75-100	65-95	55-85	25-40	8-20
	3-60	Silty clay loam, silt loam, gravelly loam.	CL	A-6, A-7	5-15	75-95	70-90	65-85	60-85	25-45	10-25
872B--Rapatee	0-15	Silt loam	ML	A-4, A-6, A-7	0	100	100	95-100	90-100	35-45	7-15
	15-60	Silty clay loam, silt loam.	CL-ML, ML, CL	A-4, A-6, A-7	0-10	100	75-100	70-100	65-95	25-50	5-20
872C--Rapatee	0-15	Silty clay loam	ML	A-6, A-7	0	100	100	95-100	85-100	35-50	10-20
	15-60	Silty clay loam, silt loam.	CL-ML, ML, CL	A-4, A-6, A-7	0-10	100	75-100	70-100	65-95	25-50	5-20
2017*:											
Keomah	0-21	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	21-46	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	100	95-100	45-60	30-45
	46-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	100	95-100	35-50	15-30
Urban land.											
2036B*:											
Tama	0-14	Silt loam	ML, CL	A-6, A-7	0	100	100	100	95-100	35-45	10-20
	14-38	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	15-25
	38-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
Urban land.											
2224D*:											
Strawn	0-8	Silt loam	CL, ML, CL-ML	A-4, A-6	0	95-100	95-100	90-100	90-100	20-40	3-20
	8-26	Silty clay loam, clay loam.	CL	A-6, A-7	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	26-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-5	75-100	70-100	60-95	40-95	20-35	7-18
Urban land.											
2279B*:											
Rozetta	0-5	Silt loam	CL	A-4, A-6	0	100	100	95-100	95-100	24-35	8-15
	5-17	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-30	5-15
	17-43	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	43-60	Silt loam	CL	A-6, A-4	0	100	100	95-100	85-100	25-40	7-20
Urban land.											

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
2290A*:											
Warsaw	0-16	Silt loam	CL, CL-ML	A-4, A-6	0	85-100	85-100	70-100	50-90	20-30	4-12
	16-20	Sandy clay loam, loam, clay loam.	SC, CL, CL-ML, SM-SC	A-6, A-2-6, A-4, A-2-4	0-3	90-100	85-100	60-90	30-70	20-35	6-15
	20-35	Gravelly sandy clay loam, gravelly clay loam.	CL, SC, GC, SM-SC	A-6, A-2-6, A-4, A-2-4	0-5	70-90	60-85	55-70	30-60	20-35	6-15
	35-60	Stratified sand to very gravelly coarse sand.	SP, GP, SP-SM, GP-GM	A-1	1-5	30-70	22-55	7-20	2-10	<20	NP
Urban land.											
2439B*:											
Jasper	0-16	Loam	CL-ML, CL	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	16-43	Loam, clay loam, sandy clay loam.	CL-ML, CL, SM-SC, SC	A-4, A-6	0	100	100	60-100	35-85	20-35	5-20
	43-60	Loamy sand, sand	SM, SP-SM, SC, SM-SC	A-2-4, A-3	0	100	100	50-75	5-30	<25	NP-10
Urban land.											
2802B*:											
Orthents.											
Urban land.											
3070	0-12	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-25
Beaucoup	12-52	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-30
	52-60	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	90-100	65-95	25-45	5-25
3406	0-11	Silt loam	ML, CL-ML	A-4	0	100	100	85-100	80-100	<30	4-10
Paxico	11-60	Silt loam	ML, CL-ML	A-4	0	100	100	90-100	90-100	<30	4-10
7070	0-12	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-25
Beaucoup	12-52	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-30
	52-60	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	90-100	65-95	25-45	5-25

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
8D, 8E, 8G------- Hickory	0-7 7-45 45-60	19-25 27-35 15-32	1.30-1.50 1.45-1.65 1.50-1.70	0.6-2.0 0.6-2.0 0.6-2.0	0.20-0.22 0.15-0.19 0.11-0.19	4.5-7.3 4.5-6.0 5.1-8.4	Low---------- Moderate----- Low----------	0.37 0.37 0.37	5	6	1-2
16--------------- Rushville	0-10 10-15 15-33 33-50 50-60	15-27 10-22 35-45 30-42 18-30	1.25-1.45 1.30-1.50 1.30-1.50 1.40-1.60 1.40-1.55	0.6-2.0 0.06-0.2 <0.06 <0.2 0.06-0.2	0.22-0.24 0.15-0.20 0.09-0.20 0.11-0.20 0.16-0.21	4.5-7.3 4.5-7.3 4.5-6.5 4.5-7.8 5.6-8.4	Low---------- Low---------- High--------- High--------- Moderate-----	0.43 0.43 0.43 0.43 0.43	3	6	1-3
17--------------- Keomah	0-20 20-46 46-60	16-22 27-42 24-38	1.30-1.40 1.30-1.45 1.40-1.55	0.6-2.0 0.06-0.6 0.2-0.6	0.22-0.24 0.18-0.20 0.18-0.20	4.5-7.3 4.5-5.5 5.1-6.5	Low---------- High--------- Moderate-----	0.37 0.37 0.37	5	6	1-2
19C3, 19D3, 19E3- Sylvan	0-7 7-23 23-60	27-32 25-35 18-27	1.25-1.45 1.30-1.50 1.30-1.50	0.6-2.0 0.6-2.0 0.6-2.0	0.20-0.22 0.18-0.20 0.20-0.22	5.6-7.3 5.6-7.8 6.6-8.4	Moderate----- Moderate----- Low----------	0.37 0.37 0.37	4	7	<1
24C2, 24D-------- Dodge	0-12 12-27 27-32 32-60	10-20 25-32 15-32 10-25	1.35-1.55 1.45-1.55 1.45-1.55 1.40-1.80	0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0	0.22-0.24 0.18-0.22 0.10-0.19 0.08-0.18	5.1-7.3 5.1-6.5 6.1-7.8 7.4-8.4	Low---------- Moderate----- Moderate----- Low----------	0.37 0.37 0.37 0.28	5	5	1-3
28--------------- Jules	0-8 8-60	10-20 10-18	1.15-1.40 1.20-1.50	0.6-2.0 0.6-2.0	0.20-0.24 0.17-0.22	7.4-8.4 7.4-8.4	Low---------- Low----------	0.37 0.37	5	4L	1-2
36B, 36C2-------- Tama	0-16 16-43 43-60	20-26 27-35 20-30	1.25-1.30 1.30-1.35 1.35-1.40	0.6-2.0 0.6-2.0 0.6-2.0	0.22-0.24 0.18-0.20 0.18-0.20	5.1-7.3 5.1-6.0 5.6-7.3	Moderate----- Moderate----- Moderate-----	0.32 0.43 0.43	5	6	3-4
37B-------------- Worthen	0-25 25-60	15-22 18-24	1.20-1.40 1.20-1.40	0.6-2.0 0.6-2.0	0.22-0.24 0.20-0.22	5.6-7.3 5.6-7.8	Low---------- Low----------	0.32 0.43	5	6	3-4
43--------------- Ipava	0-19 19-51 51-60	20-27 35-43 20-27	1.15-1.35 1.25-1.50 1.30-1.55	0.6-2.0 0.2-0.6 0.2-0.6	0.22-0.24 0.11-0.20 0.20-0.22	5.6-7.3 5.6-7.8 6.1-8.4	Moderate----- High--------- Moderate-----	0.28 0.43 0.43	5	6	4-5
45--------------- Denny	0-9 9-21 21-47 47-60	20-27 15-22 35-45 25-35	1.25-1.45 1.25-1.45 1.20-1.40 1.40-1.60	0.6-2.0 0.2-0.6 0.06-0.2 0.2-0.6	0.22-0.24 0.18-0.20 0.11-0.22 0.20-0.22	5.6-7.3 5.6-6.5 5.6-6.5 5.6-7.8	Low---------- Low---------- High--------- Moderate-----	0.37 0.37 0.37 0.37	3	6	3-4
54B, 54D--------- Plainfield	0-8 8-31 31-60	3-7 0-4 0-4	1.50-1.65 1.50-1.65 1.50-1.70	2.0-6.0 6.0-20 6.0-20	0.09-0.12 0.04-0.07 0.04-0.07	4.5-7.3 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.17 0.17 0.17	5	2	<1
59--------------- Lisbon	0-8 8-34 34-41 41-60	20-25 25-35 20-30 18-27	1.10-1.30 1.15-1.35 1.45-1.55 1.50-1.60	0.6-2.0 0.6-2.0 0.6-2.0 0.2-0.6	0.22-0.24 0.18-0.22 0.15-0.20 0.07-0.11	5.6-7.3 6.1-7.8 6.1-8.4 7.4-8.4	Low---------- Moderate----- Low---------- Low----------	0.28 0.43 0.43 0.43	4	6	3-5
67--------------- Harpster	0-16 16-45 45-60	27-35 27-35 22-35	1.05-1.25 1.20-1.50 1.25-1.55	0.6-2.0 0.6-2.0 0.6-2.0	0.21-0.24 0.18-0.22 0.17-0.22	7.4-8.4 7.4-8.4 7.4-8.4	Moderate----- Moderate----- Moderate-----	0.28 0.28 0.28	5	4L	5-6

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
68----------	0-17	27-35	1.15-1.35	0.6-2.0	0.21-0.23	5.6-7.3	Moderate-----	0.28	5	7	5-6
Sable	17-46	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.28			
	46-60	20-28	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.28			
74----------	0-15	18-27	1.40-1.60	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	2-4
Radford	15-24	18-27	1.40-1.60	0.6-2.0	0.20-0.22	6.1-7.8	Low----------	0.28			
	24-60	24-35	1.35-1.55	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-----	0.28			
77----------	0-28	18-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.28	5	6	3-4
Huntsville	28-38	18-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.8	Moderate-----	0.28			
	38-60	10-25	1.20-1.50	0.6-2.0	0.17-0.21	5.6-7.8	Low----------	0.28			
87B----------	0-9	10-18	1.50-1.55	2.0-6.0	0.12-0.15	5.6-7.3	Low----------	0.20	4	3	1-2
Dickinson	9-24	10-15	1.45-1.55	2.0-6.0	0.12-0.15	5.1-6.5	Low----------	0.20			
	24-31	4-10	1.55-1.65	6.0-20	0.08-0.10	5.1-6.5	Low----------	0.20			
	31-60	4-10	1.60-1.70	6.0-20	0.02-0.04	5.6-6.5	Low----------	0.15			
92A----------	0-4	2-5	1.20-1.50	>6.0	0.05-0.09	6.6-8.4	Low----------	0.17	5	2	<1
Sarpy	4-60	2-5	1.20-1.50	>6.0	0.05-0.09	7.4-8.4	Low----------	0.15			
104----------	0-9	15-27	1.15-1.35	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.32	5	6	2-4
Virgil	9-14	15-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.43			
	14-50	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-7.8	Moderate-----	0.43			
	50-60	15-30	1.45-1.75	0.6-6.0	0.05-0.11	5.6-8.4	Low----------	0.28			
107----------	0-16	27-35	1.20-1.40	0.6-2.0	0.21-0.23	6.1-7.8	Moderate-----	0.28	5	7	4-5
Sawmill	16-33	27-35	1.20-1.40	0.6-2.0	0.21-0.23	6.1-7.8	Moderate-----	0.28			
	33-50	25-35	1.30-1.45	0.6-2.0	0.17-0.20	6.1-7.8	Moderate-----	0.28			
	50-60	18-35	1.35-1.50	0.6-2.0	0.15-0.19	6.1-8.4	Moderate-----	0.28			
119D2, 119E------	0-9	20-27	1.20-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	4	6	1-3
Elco	9-27	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.8	Moderate-----	0.37			
	27-60	25-45	1.45-1.70	0.06-0.6	0.14-0.20	5.1-7.8	High---------	0.37			
131D2----------	0-7	10-15	1.45-1.65	2.0-6.0	0.14-0.20	4.5-7.3	Low----------	0.24	5	3	.5-1
Alvin	7-14	10-15	1.45-1.65	0.6-6.0	0.14-0.20	4.5-6.0	Low----------	0.24			
	14-47	15-18	1.45-1.65	0.6-6.0	0.12-0.20	4.5-6.0	Low----------	0.24			
	47-60	3-10	1.55-1.75	2.0-6.0	0.05-0.13	5.1-8.4	Low----------	0.24			
132----------	0-13	18-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
Starks	13-26	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.5	Moderate-----	0.37			
	26-44	18-30	1.45-1.65	0.6-2.0	0.16-0.19	5.1-7.8	Moderate-----	0.37			
	44-60	5-30	1.55-1.75	0.6-2.0	0.08-0.18	5.1-7.8	Low----------	0.37			
134B, 134C2, 134D2----------	0-8	14-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-2
Camden	8-34	22-35	1.35-1.55	0.6-2.0	0.16-0.20	5.1-7.3	Moderate-----	0.37			
	34-43	18-30	1.45-1.65	0.6-2.0	0.11-0.22	5.6-7.3	Low----------	0.37			
	43-60	5-20	1.55-1.75	0.6-6.0	0.11-0.22	5.6-8.4	Low----------	0.37			
145B2, 145C2-----	0-8	20-26	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	3-4
Saybrook	8-23	27-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
	23-60	24-35	1.50-1.70	0.6-2.0	0.15-0.21	6.1-8.4	Low----------	0.43			
148B, 148C2------	0-11	18-27	1.10-1.30	0.6-2.0	0.22-0.24	5.1-7.8	Low----------	0.32	5	6	3-4
Proctor	11-28	25-35	1.20-1.45	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
	28-33	22-35	1.20-1.45	0.6-2.0	0.15-0.19	5.6-7.3	Moderate-----	0.43			
	33-60	15-32	1.40-1.70	0.6-6.0	0.07-0.19	6.1-7.8	Low----------	0.43			
149----------	0-16	20-27	1.25-1.50	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	4-5
Brenton	16-29	25-35	1.30-1.55	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.28			
	29-60	15-30	1.50-1.70	0.6-2.0	0.11-0.20	5.6-8.4	Low----------	0.28			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
152----------	0-17	27-35	1.10-1.30	0.6-2.0	0.21-0.23	5.6-7.8	Moderate-----	0.28	5	7	5-7
Drummer	17-46	20-35	1.20-1.45	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28			
	46-60	15-32	1.40-1.70	0.6-2.0	0.11-0.19	6.6-8.4	Low----------	0.28			
171B2, 171C2-----	0-10	18-27	1.15-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.32	5	6	3-4
Catlin	10-43	27-35	1.25-1.55	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	43-60	20-30	1.40-1.70	0.6-2.0	0.07-0.11	6.1-8.4	Low----------	0.43			
198----------	0-18	22-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	4-5
Elburn	18-50	25-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.43			
	50-60	15-25	1.50-1.70	0.6-6.0	0.12-0.18	6.1-8.4	Low----------	0.43			
199B----------	0-11	18-27	1.10-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	5-4	6	3-5
Plano	11-42	25-35	1.20-1.40	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	42-60	10-20	1.50-1.70	0.6-2.0	0.11-0.22	5.6-8.4	Low----------	0.43			
210----------	0-10	---	0.15-0.45	2.0-6.0	0.35-0.45	7.4-8.4	----------	----	5	2	>60
Lena	10-60	---	0.15-0.45	2.0-6.0	0.35-0.45	7.4-8.4	----------	----			
224D3----------	0-4	27-30	1.35-1.55	0.6-2.0	0.15-0.20	5.6-6.5	Moderate-----	0.37	3	7	1-2
Strawn	4-20	27-35	1.35-1.55	0.6-2.0	0.15-0.20	5.6-7.8	Moderate-----	0.37			
	20-60	22-30	1.50-1.70	0.2-0.6	0.08-0.12	7.4-8.4	Low----------	0.37			
224E----------	0-5	18-27	1.15-1.45	0.6-2.0	0.20-0.24	6.1-7.3	Low----------	0.37	4	6	.5-1
Strawn	5-20	27-35	1.35-1.55	0.6-2.0	0.15-0.20	5.6-7.8	Moderate-----	0.37			
	20-60	22-30	1.50-1.70	0.2-0.6	0.08-0.12	7.4-8.4	Low----------	0.37			
239----------	0-32	18-24	1.20-1.30	0.6-2.0	0.20-0.22	7.4-8.4	Low----------	0.37	5	4L	.5-1
Dorchester	32-60	18-30	1.25-1.40	0.6-2.0	0.22-0.24	6.6-7.8	Moderate-----	0.37			
243B, 243C2------	0-12	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.8	Low----------	0.37	5-4	6	1-3
St. Charles	12-51	25-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate-----	0.37			
	51-60	15-30	1.30-1.50	0.6-2.0	0.11-0.16	5.1-7.3	Low----------	0.37			
257----------	0-8	20-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.37	5	6	2-3
Clarksdale	8-13	15-27	1.25-1.50	0.2-0.6	0.20-0.22	5.1-6.5	Low----------	0.37			
	13-30	35-45	1.30-1.50	0.2-0.6	0.11-0.20	5.1-7.3	High---------	0.37			
	30-60	20-30	1.40-1.60	0.2-0.6	0.20-0.22	6.1-8.4	Moderate-----	0.37			
259C2, 259D2-----	0-15	20-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	4	6	3-4
Assumption	15-24	25-35	1.20-1.40	0.6-2.0	0.18-0.22	5.1-7.3	Moderate-----	0.43			
	24-60	30-45	1.45-1.65	0.06-0.6	0.14-0.20	5.1-7.3	High---------	0.43			
279B, 279C2------	0-8	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
Rozetta	8-13	12-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.37			
	13-49	27-35	1.35-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate-----	0.37			
	49-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	4.5-7.8	Low----------	0.37			
280C2, 280D2, 280E----------	0-9	15-25	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
Fayette	9-52	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
	52-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate-----	0.37			
282F----------	0-11	5-10	1.40-1.60	6.0-20	0.09-0.11	6.6-8.4	Low----------	0.17	5	2	.5-2
Chute	11-60	1-8	1.60-1.75	6.0-20	0.06-0.09	7.4-8.4	Low----------	0.15			
290A----------	0-16	15-25	1.30-1.50	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.28	4-3	5	2-5
Warsaw	16-20	17-30	1.35-1.60	0.6-2.0	0.16-0.19	5.1-7.3	Low----------	0.28			
	20-35	20-30	1.40-1.65	0.6-2.0	0.13-0.16	5.6-8.4	Low----------	0.28			
	35-60	2-8	1.40-1.65	>20	0.02-0.04	7.9-8.4	Low----------	0.10			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
304B---------- Landes	0-13	10-22	1.20-1.40	0.6-6.0	0.20-0.22	6.1-8.4	Low----------	0.32	4	5	1-2
	13-38	5-18	1.60-1.70	2.0-6.0	0.10-0.15	6.1-8.4	Low----------	0.32			
	38-60	5-18	1.60-1.80	6.0-20	0.05-0.15	6.1-8.4	Low----------	0.20			
330---------- Peotone	0-19	33-40	1.20-1.40	0.2-0.6	0.12-0.23	5.6-7.8	High---------	0.28	5	4	5-7
	19-48	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.1-7.8	High---------	0.28			
	48-60	25-42	1.40-1.65	0.2-0.6	0.18-0.20	6.6-8.4	High---------	0.28			
344B---------- Harvard	0-16	20-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.8	Low----------	0.32	5	6	2-3
	16-29	25-35	1.25-1.55	0.6-2.0	0.15-0.20	5.1-7.3	Moderate-----	0.43			
	29-35	15-35	1.30-1.60	0.6-2.0	0.12-0.19	5.6-7.8	Low----------	0.43			
	35-60	5-30	1.40-1.70	2.0-6.0	0.05-0.15	5.1-8.4	Low----------	0.43			
386B---------- Downs	0-9	15-25	1.25-1.30	2.0-6.0	0.21-0.23	5.1-7.3	Low----------	0.32	5	6	2-3
	9-44	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	44-60	18-27	1.35-1.45	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
404---------- Titus	0-12	35-45	1.30-1.50	0.06-0.2	0.11-0.22	6.1-7.3	High---------	0.32	4	4	2-4
	12-46	35-45	1.30-1.60	0.06-0.2	0.11-0.22	6.1-7.8	High---------	0.32			
	46-60	5-30	1.45-1.75	0.2-0.6	0.10-0.20	6.1-8.4	Moderate-----	0.32			
406---------- Paxico	0-11	10-22	1.20-1.40	0.6-2.0	0.18-0.23	6.6-7.8	Low----------	0.37	5	4L	1-2
	11-60	10-18	1.25-1.45	0.6-2.0	0.18-0.23	7.4-8.4	Low----------	0.37			
415---------- Orion	0-6	10-18	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.37	5	5	1-3
	6-24	10-18	1.20-1.30	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
	24-42	10-30	1.25-1.45	0.6-2.0	0.18-0.22	5.6-7.8	Low----------	0.37			
	42-60	10-18	1.20-1.40	0.6-2.0	0.18-0.22	5.6-7.8	Low----------	0.37			
439B---------- Jasper	0-18	10-22	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	5-4	6	1-3
	18-40	20-32	1.40-1.60	0.6-2.0	0.13-0.19	5.1-6.5	Low----------	0.28			
	40-60	2-10	1.50-1.70	6.0-20	0.05-0.10	6.1-7.8	Low----------	0.17			
451---------- Lawson	0-17	10-27	1.20-1.55	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	5	5	3-5
	17-35	10-30	1.20-1.55	0.6-2.0	0.18-0.22	6.1-7.8	Low----------	0.28			
	35-60	18-30	1.55-1.65	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-----	0.43			
533*. Urban land											
536*. Dumps											
549C2---------- Marseilles	0-11	20-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	4	6	1-3
	11-28	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-6.5	Moderate-----	0.37			
	28-39	25-42	1.35-1.60	0.06-0.2	0.09-0.20	4.5-6.5	Moderate-----	0.37			
	39-60	---	---	0.01-0.2	---	---	----------	----			
549E, 549G------- Marseilles	0-10	20-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	4	6	1-3
	10-26	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-6.5	Moderate-----	0.37			
	26-39	25-42	1.35-1.60	0.06-0.2	0.09-0.20	4.5-6.5	Moderate-----	0.37			
	39-60	---	---	---	---	---	----------	----			
567B2, 567C2----- Elkhart	0-8	27-35	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.8	Moderate-----	0.32	4	7	1-3
	8-32	25-35	1.25-1.45	0.6-2.0	0.18-0.20	5.6-8.4	Moderate-----	0.43			
	32-60	20-27	1.35-1.55	0.6-2.0	0.20-0.22	7.4-8.4	Low----------	0.43			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
709A, 709B2--	0-9	20-27	1.20-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.32	5	6	2-4
Osceola	9-15	15-27	1.20-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low	0.32			
	15-41	30-45	1.30-1.50	0.2-0.6	0.15-0.18	5.1-7.3	High	0.43			
	41-47	10-30	1.45-1.65	0.6-6.0	0.10-0.15	5.1-7.3	Low	0.24			
	47-52	30-45	1.60-1.70	0.06-0.2	0.11-0.15	6.1-7.8	Moderate	0.37			
	52-60	---	---	---	---	---	---	---			
857G*:											
Strawn--	0-8	18-27	1.15-1.45	0.6-2.0	0.20-0.24	6.1-7.3	Low	0.37	4	6	1-3
	8-26	30-40	1.35-1.55	0.6-2.0	0.15-0.20	5.6-7.8	Moderate	0.37			
	26-60	22-30	1.50-1.70	0.2-0.6	0.08-0.12	7.4-8.4	Low	0.37			
Hennepin--	0-4	20-30	1.20-1.40	0.6-2.0	0.18-0.24	6.1-7.8	Low	0.32	4	5	1-2
	4-16	18-30	1.30-1.60	0.2-0.6	0.14-0.22	6.1-8.4	Low	0.32			
	16-60	18-30	1.70-1.85	0.2-0.6	0.14-0.20	7.4-8.4	Low	0.32			
864*, 865*.											
Pits											
871B, 871D, 871G-	0-3	20-27	1.30-1.60	0.2-2.0	0.17-0.20	6.6-8.4	Moderate	0.37	5	4L	.5-4
Lenzburg	3-60	20-35	1.40-1.70	0.2-0.6	0.11-0.17	7.4-8.4	Moderate	0.37			
872B--	0-15	24-27	1.25-1.60	0.2-0.6	0.15-0.20	6.1-7.3	Low	0.37	3	6	3-5
Rapatee	15-60	15-35	1.50-1.90	0.06-0.6	0.08-0.15	6.6-8.4	Moderate	0.37			
872C--	0-15	27-35	1.30-1.60	0.2-0.6	0.10-0.20	6.1-7.3	Moderate	0.37	3	7	3-5
Rapatee	15-60	15-35	1.50-1.90	0.06-0.6	0.08-0.15	6.6-8.4	Moderate	0.37			
2017*:											
Keomah--	0-21	16-22	1.30-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low	0.37	5	6	1-2
	21-46	27-42	1.30-1.45	0.06-0.6	0.18-0.20	4.5-5.5	High	0.37			
	46-60	24-38	1.40-1.55	0.2-0.6	0.18-0.20	5.1-6.5	Moderate	0.37			
Urban land.											
2036B*:											
Tama--	0-14	20-26	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate	0.32	5	6	3-4
	14-38	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-6.0	Moderate	0.43			
	38-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate	0.43			
Urban land.											
2224D*:											
Strawn--	0-8	18-27	1.15-1.45	0.6-2.0	0.20-0.24	6.1-7.3	Low	0.37	4	6	1-3
	8-26	27-35	1.35-1.55	0.6-2.0	0.15-0.20	5.6-7.8	Moderate	0.37			
	26-60	22-30	1.50-1.70	0.2-0.6	0.08-0.12	7.4-8.4	Low	0.37			
Urban land.											
2279B*:											
Rozetta--	0-5	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.37	5	6	1-3
	5-17	12-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low	0.37			
	17-43	27-35	1.35-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate	0.37			
	43-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	4.5-7.8	Low	0.37			
Urban land.											

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2290A*:											
Warsaw	0-16	15-25	1.30-1.50	0.6-2.0	0.20-0.24	5.6-7.3	Low	0.28	4-3	5	2-5
	16-20	17-30	1.35-1.60	0.6-2.0	0.16-0.19	5.1-6.5	Low	0.28			
	20-35	20-30	1.40-1.65	0.6-2.0	0.13-0.16	6.1-8.4	Low	0.28			
	35-60	2-8	1.40-1.65	>20	0.02-0.04	7.9-8.4	Low	0.10			
Urban land.											
2439B*:											
Jasper	0-16	10-22	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.28	5-4	6	1-2
	16-43	20-32	1.40-1.60	0.6-2.0	0.13-0.19	5.1-6.5	Low	0.28			
	43-60	2-10	1.50-1.70	6.0-20	0.05-0.10	6.1-7.8	Low	0.17			
Urban land.											
2802B*:											
Orthents.											
Urban land.											
3070	0-12	27-35	1.25-1.45	0.2-0.6	0.21-0.23	5.6-7.8	Moderate	0.32	5	7	5-6
Beaucoup	12-52	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate	0.32			
	52-60	15-30	1.35-1.55	0.2-0.6	0.18-0.22	5.6-7.8	Moderate	0.32			
3406	0-11	10-22	1.20-1.40	0.6-2.0	0.18-0.23	6.6-7.8	Low	0.37	5	4L	1-2
Paxico	11-60	10-18	1.25-1.45	0.6-2.0	0.18-0.23	7.4-8.4	Low	0.37			
7070	0-12	27-35	1.25-1.45	0.2-0.6	0.21-0.23	5.6-7.8	Moderate	0.32	5	7	5-6
Beaucoup	12-52	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate	0.32			
	52-60	15-30	1.35-1.55	0.2-0.6	0.18-0.22	5.6-7.8	Moderate	0.32			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
8D, 8E, 8G-------- Hickory	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
16---------------- Rushville	D	None---------	---	---	+1-1.0	Perched	Mar-Jun	>60	---	High-----	High-----	High.
17---------------- Keomah	C	None---------	---	---	2.0-4.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
19C3-------------- Sylvan	B	None---------	---	---	4.0-6.0	Apparent	Mar-May	>60	---	High-----	Moderate	Moderate.
19D3, 19E3-------- Sylvan	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
24C2, 24D--------- Dodge	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
28---------------- Jules	B	Frequent-----	Brief-----	Mar-Jun	>6.0	---	---	>60	---	High-----	Low------	Low.
36B, 36C2--------- Tama	B	None---------	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High-----	Moderate	Moderate.
37B--------------- Worthen	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Low------	Low.
43---------------- Ipava	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
45---------------- Denny	D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
54B, 54D---------- Plainfield	A	None---------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
59---------------- Lisbon	B	None---------	---	---	1.0-3.0	Apparent	Nov-May	>60	---	High-----	High-----	Moderate.
67---------------- Harpster	B/D	None---------	---	---	+.5-2.0	Apparent	Feb-Jun	>60	---	High-----	High-----	Low.
68---------------- Sable	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
74---- Radford	B	Occasional	Brief-----	Mar-Jun	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
77---- Huntsville	B	Occasional	Brief-----	Jan-Jun	>6.0	---	---	>60	---	High-----	Low------	Low.
87B---- Dickinson	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
92A---- Sarpy	A	Frequent----	Long------	Nov-Jun	>6.0	---	---	>60	---	Low------	Low------	Low.
104---- Virgil	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
107---- Sawmill	B/D	Frequent----	Brief-----	Mar-Jun	0-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
119D2, 119E---- Elco	B	None--------	---	---	2.5-4.5	Perched	Mar-May	>60	---	High-----	High-----	Moderate.
131D2---- Alvin	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
132---- Starks	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
134B, 134C2, 134D2---- Camden	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Low------	Moderate.
145B2, 145C2---- Saybrook	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High-----	Moderate.
148B, 148C2---- Proctor	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
149---- Brenton	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
152---- Drummer	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
171B2, 171C2---- Catlin	B	None--------	---	---	3.5-6.0	Apparent	Feb-May	>60	---	High-----	High-----	Moderate.
198---- Elburn	B	None--------	---	---	1.0-3.0	Apparent	Jan-May	>60	---	High-----	High-----	Moderate.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
199B---------- Plano	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	Low.
210---------- Lena	D	Frequent	Long	Mar-Jun	+1-1.0	Apparent	Nov-Jun	>60	---	High	High	Low.
224D3, 224E---- Strawn	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
239---------- Dorchester	B	Frequent	Very brief	Feb-Nov	>6.0	---	---	>60	---	High	High	Low.
243B, 243C2---- St. Charles	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	Moderate.
257---------- Clarksdale	C	None	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High	High	Moderate.
259C2, 259D2---- Assumption	B	None	---	---	2.5-4.5	Perched	Feb-May	>60	---	High	High	Moderate.
279B, 279C2---- Rozetta	B	None	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High	Moderate	Moderate.
280C2, 280D2, 280E---------- Fayette	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	Moderate.
282F---------- Chute	A	None	---	---	>6.0	---	---	>60	---	Low	Low	Low.
290A---------- Warsaw	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.
304B---------- Landes	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	Low	Low.
330---------- Peotone	B/D	None	---	---	+.5-1.0	Apparent	Feb-Jul	>60	---	High	High	Moderate.
344B---------- Harvard	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	Moderate.
386B---------- Downs	B	None	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High	Moderate	Moderate.
404---------- Titus	B/D	Rare	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High	High	Low.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
406--Paxico	B	Frequent	Brief	Mar-May	1.5-3.0	Apparent	Mar-May	>60	---	High	High	Low.
415--Orion	C	Frequent	Brief	Mar-Nov	1.0-3.0	Apparent	Nov-May	>60	---	High	High	Low.
439B--Jasper	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
451--Lawson	C	Frequent	Brief	Mar-Jun	1.0-3.0	Apparent	Nov-May	>60	---	High	Moderate	Low.
533*. Urban land												
536*. Dumps												
549C2--Marseilles	B	None	---	---	1.5-3.5	Perched	Feb-Jun	20-40	Soft	High	High	Moderate.
549E, 549G--Marseilles	B	None	---	---	1.5-3.5	Perched	Feb-Jun	20-40	Soft	High	High	Moderate.
567B2, 567C2--Elkhart	B	None	---	---	4.0-6.0	Apparent	Mar-May	>60	---	High	Moderate	Moderate.
709A, 709B2--Osceola	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	40-60	Soft	High	High	Moderate.
857G*: Strawn	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Hennepin	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Low.
864*, 865*. Pits												
871B, 871D, 871G--Lenzburg	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
872B, 872C--Rapatee	D	None	---	---	>6.0	---	---	>60	---	High	Moderate	Low.
2017*: Keomah	C	None	---	---	2.0-4.0	Apparent	Nov-Jul	>60	---	High	High	Moderate.
Urban land.												

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
2036B*:												
Tama	B	None	---	---	4.0-6.0	Apparent	Nov-Jun	>60	---	High	Moderate	Moderate.
Urban land.												
2224D*:												
Strawn	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Urban land.												
2279B*:												
Rozetta	B	None	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High	Moderate	Moderate.
Urban land.												
2290A*:												
Warsaw	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.
Urban land.												
2439B*:												
Jasper	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Urban land.												
2802B*:												
Orthents.												
Urban land.												
3070 Beaucoup	B/D	Frequent	Long	Mar-Jun	+.5-2.0	Apparent	Mar-Jun	>60	---	High	High	Low.
406 Paxico	B	Frequent	Long	Jan-May	1.5-3.0	Apparent	Mar-May	>60	---	High	High	Low.
7070 Beaucoup	B/D	Rare	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High	High	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

(Dashes indicate that data were not available. MAX means maximum dry density; OPT, optimum moisture; LL, liquid limit; PI, plasticity index; UN, Unified; and NP, nonplastic)

Soil name and location	Sample number	Horizon	Depth	Moisture density		Percentage passing sieve--				LL	PI	Classification	
				MAX	OPT	No. 4	No. 10	No. 40	No. 200			AASHTO	UN
			In	Lb/ cu ft	Pct					Pct			
Elkhart silt loam:	81IL-143-52-1	Ap	0-8	99	21.8	100	100	100	98	39	16	A-6(17)	CL
1,960 feet west and	-3	Bt2	14-18	99	23.0	100	100	100	100	49	23	A-7	CL
190 feet north of	-6	C1	36-43	111	16.2	100	100	100	99	30	8	A-4(8)	CL
the southeast corner of sec. 34, T. 11 N., R. 5 E.													
Hennepin loam:	82IL-143-28-1	A	0-4	94	23.8	98	95	89	62	45	15	A-7	ML
1,750 feet east and	-2	Bw	4-16	119	12.6	95	90	81	46	26	9	A-4(1)	CL
2,600 feet south of	-3	C	16-60	127	10.9	95	91	83	55	20	6	A-4(1)	CL-ML
the northwest corner of sec. 4, T. 9 N., R. 8 E.													
Plainfield loamy sand:	82IL-143-52-1	Ap	0-9	119	10.0	100	100	83	15	---	NP	A-2	SM
1,200 feet east and	-2	Bw	9-19	115	12.0	100	100	75	10	---	NP	A-3(0)	SP-SM
2,400 feet north of	-4	C	30-60	111	11.8	100	100	75	6	---	NP	A-3(0)	SP-SM
the southwest corner of sec. 6, T. 10 N., R. 9 E.													
Proctor silt loam:	81IL-143-46-1	Ap	0-11	104	19.8	100	100	100	98	36	13	A-6(14)	CL
231 feet west and	-3	Bt2	16-22	99	23.3	100	100	100	99	46	23	A-7	CL
1,356 feet north of	-7	2BC	49-60	119	12.5	100	100	96	56	22	7	A-4(1)	CL
the southeast corner of sec. 5, T. 11 N., R. 6 E.													
St. Charles silt loam:	81IL-143-18-1	Ap	0-7	109	17.2	100	100	99	96	29	6	A-4(5)	ML
50 feet east and	-5	Bt2	26-37	104	20.4	100	100	100	96	40	19	A-6(19)	CL
1,600 feet south of	-7	2BC	51-60	120	13.0	100	100	87	54	22	8	A-4(1)	CL
the northwest corner of sec. 7, T. 11 N., R. 5 E.													
Strawn loam:	82IL-143-20-1	A	0-4	105	17.7	99	98	94	62	32	6	A-4(2)	ML
1,350 feet west and	-4	Bt2	15-26	111	16.2	99	99	96	72	30	13	A-6(7)	CL
2,000 feet south of	-5	C	26-60	117	14.8	96	94	89	70	29	12	A-6(6)	CL
the northeast corner of sec. 4, T. 9 N., R. 8 E.													
Tama silt loam:	81IL-143-47-1	Ap	0-8	101	20.0	100	100	99	97	37	13	A-6(14)	CL
300 feet north and	-5	Bt2	23-27	100	21.8	100	100	100	99	45	22	A-7	CL
300 feet east of	-8	C	57-60	108	18.0	100	100	100	100	34	12	A-6(13)	CL
the southwest corner of sec. 30, T. 11 N., R. 6 E.													

TABLE 19.--CLASSIFICATION OF THE SOILS

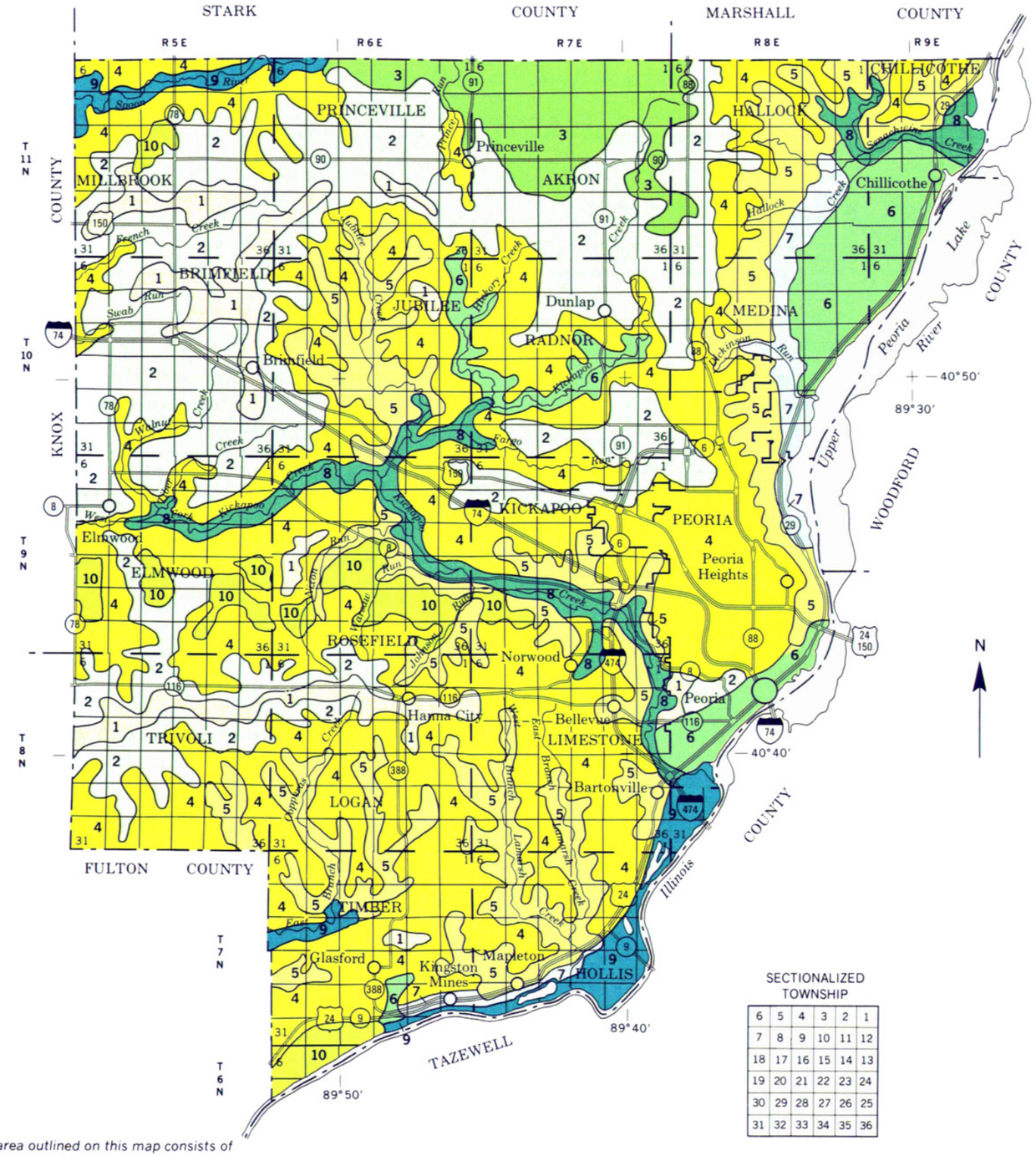
(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
*Assumption	Fine-silty, mixed, mesic Typic Argiudolls
Beaucoup	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls
Brenton	Fine-silty, mixed, mesic Aquic Argiudolls
Camden	Fine-silty, mixed, mesic Typic Hapludalfs
Catlin	Fine-silty, mixed, mesic Typic Argiudolls
Chute	Mixed, mesic Typic Udipsamments
Clarksdale	Fine, montmorillonitic, mesic Udollic Ochraqualfs
Denny	Fine, montmorillonitic, mesic Mollic Albaqualfs
Dickinson	Coarse-loamy, mixed, mesic Typic Hapludolls
Dodge	Fine-silty, mixed, mesic Typic Hapludalfs
Dorchester	Fine-silty, mixed (calcareous), mesic Typic Udifluvents
Downs	Fine-silty, mixed, mesic Mollic Hapludalfs
Drummer	Fine-silty, mixed, mesic Typic Haplaquolls
Elburn	Fine-silty, mixed, mesic Aquic Argiudolls
Elco	Fine-silty, mixed, mesic Typic Hapludalfs
*Elkhart	Fine-silty, mixed, mesic Typic Argiudolls
Fayette	Fine-silty, mixed, mesic Typic Hapludalfs
Harpster	Fine-silty, mesic Typic Calciaquolls
Harvard	Fine-silty, mixed, mesic Mollic Hapludalfs
Hennepin	Fine-loamy, mixed, mesic Typic Eutrochrepts
Hickory	Fine-loamy, mixed, mesic Typic Hapludalfs
Huntsville	Fine-silty, mixed, mesic Cumulic Hapludolls
Ipava	Fine, montmorillonitic, mesic Aquic Argiudolls
Jasper	Fine-loamy, mixed, mesic Typic Argiudolls
Jules	Coarse-silty, mixed (calcareous), mesic Typic Udifluvents
Keomah	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Landes	Coarse-loamy, mixed, mesic Fluventic Hapludolls
Lawson	Fine-silty, mixed, mesic Cumulic Hapludolls
Lena	Euic, mesic Typic Medisaprists
Lenzburg	Fine-loamy, mixed (calcareous), mesic Typic Udorthents
Lisbon	Fine-silty, mixed, mesic Aquic Argiudolls
Marseilles	Fine-silty, mixed, mesic Typic Hapludalfs
Orion	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
Orthents	Loamy, mixed, mesic Udorthents
Osceola	Fine, mixed, mesic, Udollic Ochraqualfs
Paxico	Coarse-silty, mixed (calcareous), mesic Aeric Fluvaquents
Peotone	Fine, montmorillonitic, mesic Cumulic Haplaquolls
Plainfield	Mixed, mesic Typic Udipsamments
Plano	Fine-silty, mixed, mesic Typic Argiudolls
Proctor	Fine-silty, mixed, mesic Typic Argiudolls
Radford	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
Rapatee	Fine-silty, mixed, nonacid, mesic Typic Udorthents
Rozetta	Fine-silty, mixed, mesic Typic Hapludalfs
Rushville	Fine, montmorillonitic, mesic Typic Albaqualfs
Sable	Fine-silty, mixed, mesic Typic Haplaquolls
Sarpy	Mixed, mesic Typic Udipsamments
Sawmill	Fine-silty, mixed, mesic Cumulic Haplaquolls
*Saybrook	Fine-silty, mixed, mesic Typic Argiudolls
St. Charles	Fine-silty, mixed, mesic Typic Hapludalfs
Starks	Fine-silty, mixed, mesic Aeric Ochraqualfs
Strawn	Fine-loamy, mixed, mesic Typic Hapludalfs
Sylvan	Fine-silty, mixed, mesic Typic Hapludalfs
Tama	Fine-silty, mixed, mesic Typic Argiudolls
Titus	Fine, montmorillonitic, mesic Fluvaquentic Haplaquolls
Virgil	Fine-silty, mixed, mesic Udollic Ochraqualfs
Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls
Worthen	Fine-silty, mixed, mesic Cumulic Hapludolls

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SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

SOIL LEGEND *

NEARLY LEVEL TO MODERATELY SLOPING, POORLY DRAINED TO WELL DRAINED SOILS ON UPLANDS AND STREAM TERRACES

1 — SABLE-IPAVA association: Nearly level, poorly drained and somewhat poorly drained, silty soils; formed in loess

2 — IPAVA-TAMA-ELKHART association: Nearly level to moderately sloping, somewhat poorly drained and moderately well drained, silty soils; formed in loess

3 — PROCTOR-ELBURN-DRUMMER association: Nearly level to moderately sloping, well drained, somewhat poorly drained, and poorly drained, silty soils; formed in loess over outwash

NEARLY LEVEL TO VERY STEEP, WELL DRAINED TO SOMEWHAT POORLY DRAINED SOILS ON UPLANDS

4 — ROZETTA-KEOMAH-SYLVAN association: Nearly level to strongly sloping, somewhat poorly drained to well drained, silty soils; formed in loess

5 — HICKORY-STRAWN-MARSEILLES association: Strongly sloping to very steep, well drained and moderately well drained, silty and loamy soils; formed mainly in glacial till or in material weathered from shale

NEARLY LEVEL TO STRONGLY SLOPING, WELL DRAINED AND EXCESSIVELY DRAINED SOILS ON STREAM TERRACES

6 — WARSAW-DICKINSON-PLAINFIELD association: Nearly level to strongly sloping, well drained and excessively drained, loamy, silty, and sandy soils; formed in outwash and in drift

NEARLY LEVEL AND GENTLY SLOPING, WELL DRAINED, SOMEWHAT POORLY DRAINED, AND POORLY DRAINED SOILS ON FLOOD PLAINS AND STREAM TERRACES

7 — DORCHESTER-LANDES association: Nearly level and gently sloping, well drained, loamy and silty soils; formed in alluvium

8 — JULES-PAXICO-LAWSON association: Nearly level, well drained and somewhat poorly drained, silty soils; formed in alluvium

9 — BEAUCOUP-TITUS association: Nearly level, poorly drained, silty soils; formed in alluvium

GENTLY SLOPING TO VERY STEEP, WELL DRAINED SOILS IN SURFACE-MINED AREAS

10 — LENZBURG-RAPATEE association: Gently sloping to very steep, well drained, silty soils; formed in mine spoil and in replaced soil material underlain by mine spoil

* Texture terms in the descriptive headings refer to the surface layer of the major soils in the associations.

Compiled 1985

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ILLINOIS AGRICULTURAL EXPERIMENT STATION

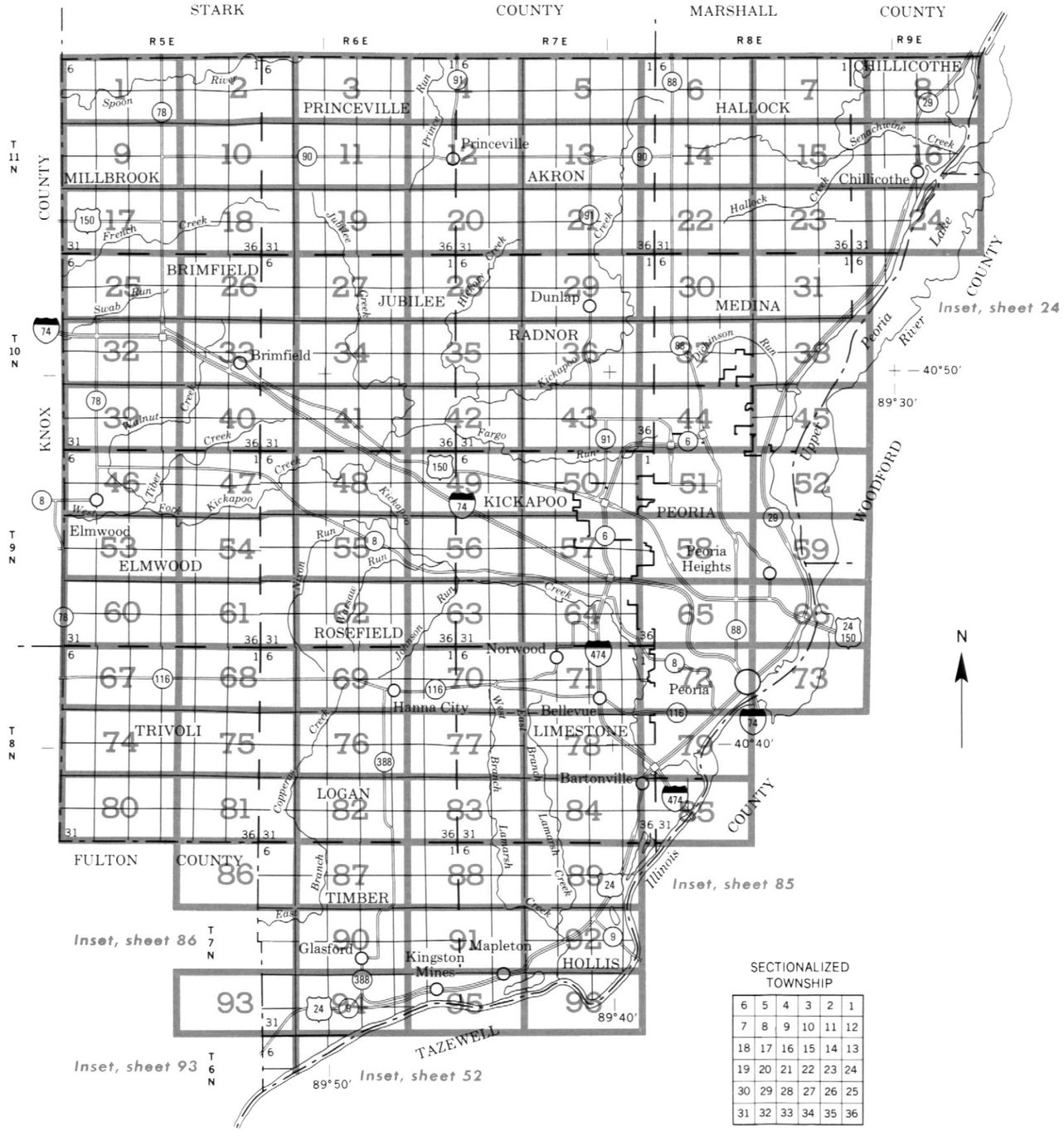
GENERAL SOIL MAP

PEORIA COUNTY, ILLINOIS

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Original text from each individual map sheet read:

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEX TO MAP SHEETS

PEORIA COUNTY, ILLINOIS

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km

SOIL LEGEND

Map symbols consist of numbers or a combination of numbers and a letter. The initial numbers represent the kind of soil or miscellaneous area. A capital letter following these numbers indicates the class of slope. Symbols without a slope letter are for nearly level soils or miscellaneous areas. A final number of 2 following the slope letter indicates that the soil is moderately eroded and 3 that it is severely eroded.

SYMBOL	NAME
8D	Hickory silt loam, 8 to 15 percent slopes
8E	Hickory silt loam, 15 to 30 percent slopes
8G	Hickory loam, 30 to 50 percent slopes
16	Rushville silt loam
17	Keomah silt loam
19C3	Sylvan silty clay loam, 5 to 10 percent slopes, severely eroded
19D3	Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded
19E3	Sylvan silty clay loam, 15 to 20 percent slopes, severely eroded
24C2	Dodge silt loam, 5 to 10 percent slopes, eroded
24D	Dodge silt loam, 10 to 18 percent slopes
28	Jules silt loam
36B	Tama silt loam, 1 to 5 percent slopes
36C2	Tama silt loam, 5 to 10 percent slopes, eroded
37B	Worthen silt loam, 1 to 5 percent slopes
43	Ipava silt loam
45	Denny silt loam
54B	Plainfield loamy sand, 3 to 7 percent slopes
54D	Plainfield loamy sand, 7 to 18 percent slopes
59	Lisbon silt loam
67	Harpster silty clay loam
68	Sable silty clay loam
74	Radford silt loam
77	Huntsville silt loam
87B	Dickinson sandy loam, 1 to 4 percent slopes
92A	Sarpy loamy sand, 0 to 3 percent slopes
104	Virgil silt loam
107	Sawmill silty clay loam
119D2	Elco silt loam, 8 to 15 percent slopes, eroded
119E	Elco silt loam, 15 to 20 percent slopes
131D2	Alvin fine sandy loam, 7 to 15 percent slopes, eroded
132	Starks silt loam
134B	Camden silt loam, 2 to 5 percent slopes
134C2	Camden silt loam, 5 to 10 percent slopes, eroded
134D2	Camden silt loam, 10 to 18 percent slopes, eroded
145B2	Saybrook silt loam, 2 to 5 percent slopes, eroded
145C2	Saybrook silt loam, 5 to 10 percent slopes, eroded
148B	Proctor silt loam, 2 to 5 percent slopes
148C2	Proctor silt loam, 5 to 10 percent slopes, eroded
149	Brenton silt loam
152	Drummer silty clay loam
171B2	Catlin silt loam, 2 to 5 percent slopes, eroded
171C2	Catlin silt loam, 5 to 10 percent slopes, eroded
198	Elburn silt loam
199B	Plano silt loam, 1 to 5 percent slopes
210	Lena muck
224D3	Strawn silty clay loam, 8 to 15 percent slopes, severely eroded
224E	Strawn silt loam, 15 to 30 percent slopes
239	Dorchester silt loam
243B	St. Charles silt loam, 2 to 5 percent slopes
243C2	St. Charles silt loam, 5 to 10 percent slopes, eroded
257	Clarksdale silt loam
259C2	Assumption silt loam, 5 to 10 percent slopes, eroded
259D2	Assumption silt loam, 10 to 15 percent slopes, eroded
279B	Rozetta silt loam, 1 to 5 percent slopes
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded
280D2	Fayette silt loam, 10 to 15 percent slopes, eroded
280E	Fayette silt loam, 15 to 30 percent slopes
282F	Chute loamy fine sand, 18 to 35 percent slopes
290A	Warsaw silt loam, 0 to 3 percent slopes
304B	Landes loam, 1 to 5 percent slopes
330	Peotone silty clay loam
344B	Harvard silt loam, 2 to 5 percent slopes
386B	Downs silt loam, 1 to 5 percent slopes
404	Titus silty clay loam
406	Paxico silt loam, frequently flooded, brief duration
415	Orion silt loam
439B	Jasper loam, sandy substratum, 1 to 4 percent slopes
451	Lawson silt loam
533	Urban land
536	Dumps, mine
549C2	Marseilles silt loam, 5 to 10 percent slopes, eroded
549E	Marseilles silt loam, 15 to 30 percent slopes
549G	Marseilles silt loam, 30 to 60 percent slopes
567B2	Elkhart silty clay loam, 2 to 5 percent slopes, eroded
567C2	Elkhart silty clay loam, 5 to 10 percent slopes, eroded
709A	Osceola silt loam, 0 to 2 percent slopes
709B2	Osceola silt loam, 2 to 5 percent slopes, eroded
857G	Strawn-Hennepin loams, 30 to 60 percent slopes
864	Pits, quarries
865	Pits, gravel
871B	Lenzburg silt loam, 1 to 7 percent slopes, stony
871D	Lenzburg silt loam, 7 to 20 percent slopes, stony
871G	Lenzburg silt loam, 20 to 60 percent slopes, stony
872B	Rapatee silt loam, 1 to 5 percent slopes
872C	Rapatee silty clay loam, 5 to 12 percent slopes
2017	Keomah-Urban land complex
2036B	Tama-Urban land complex, 1 to 5 percent slopes
2224D	Strawn-Urban land complex, 8 to 20 percent slopes
2279B	Rozetta-Urban land complex, 3 to 8 percent slopes
2290A	Warsaw-Urban land complex, 0 to 3 percent slopes
2439B	Jasper, sandy substratum-Urban land complex, 1 to 7 percent slopes
2802B	Orthents-Urban land complex, undulating
3070	Beaucoup silty clay loam, frequently flooded
3406	Paxico silt loam, frequently flooded, long duration
7070	Beaucoup silty clay loam, rarely flooded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- County or parish
- Reservation (national forest or park, state forest or park, and large airport)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, cemetery — Davis Airstrip

STATE COORDINATE TICK — 1890 000 FEET

LAND DIVISION CORNERS (sections)

ROADS

- Divided (median shown if scale permits)
- Other roads

ROAD EMBLEMS & DESIGNATIONS

- Interstate — 74
- Federal — 150
- State — 116

RAILROAD

LEVEES

- Without road

DAMS

- Large (to scale)
- Medium or small — water

PITS

- Gravel pit

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Drainage ditch

LAKES, PONDS AND RESERVOIRS

- Perennial — water

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — 43 36B

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

DEPRESSION OR SINK

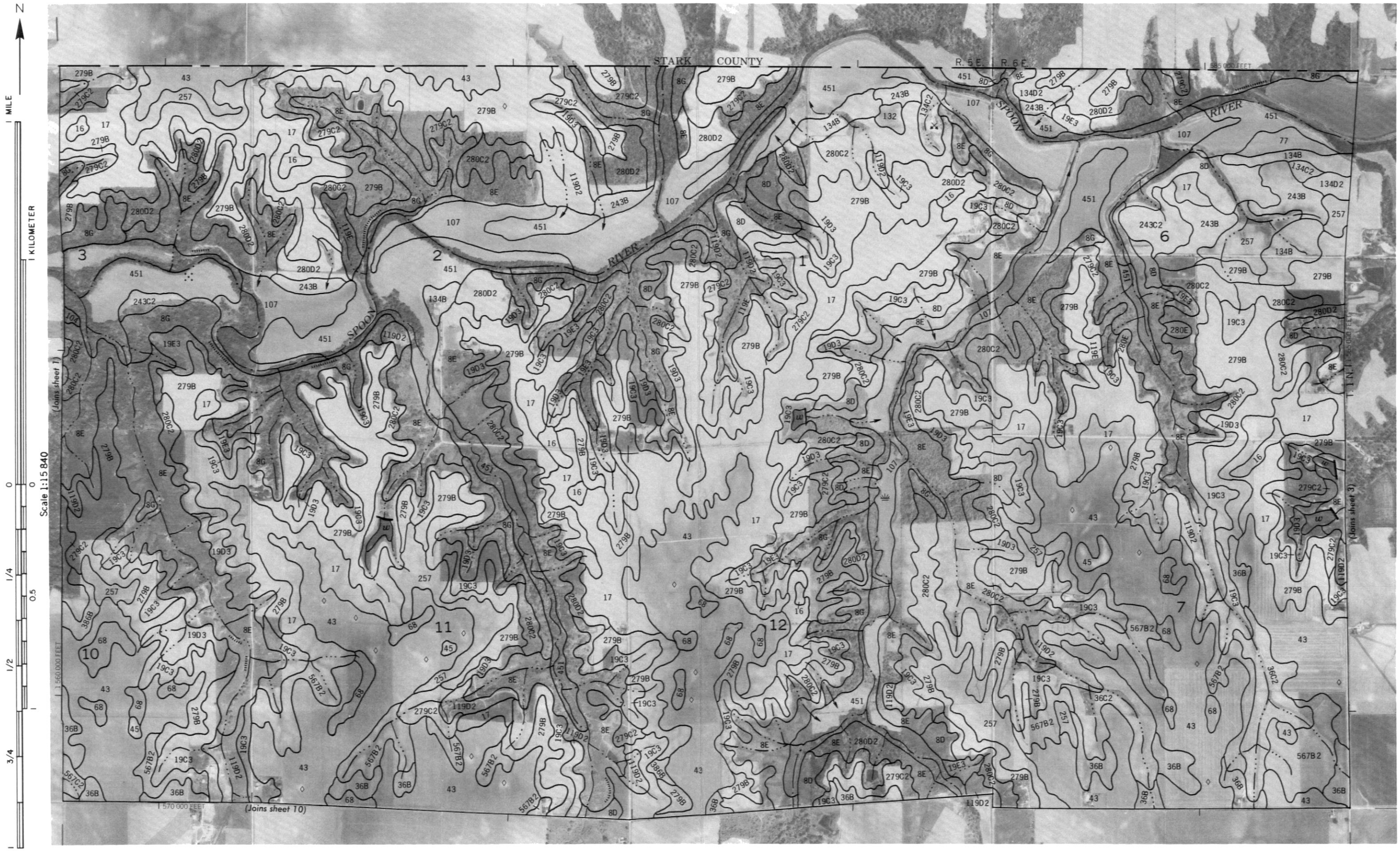
SOIL SAMPLE SITE — S

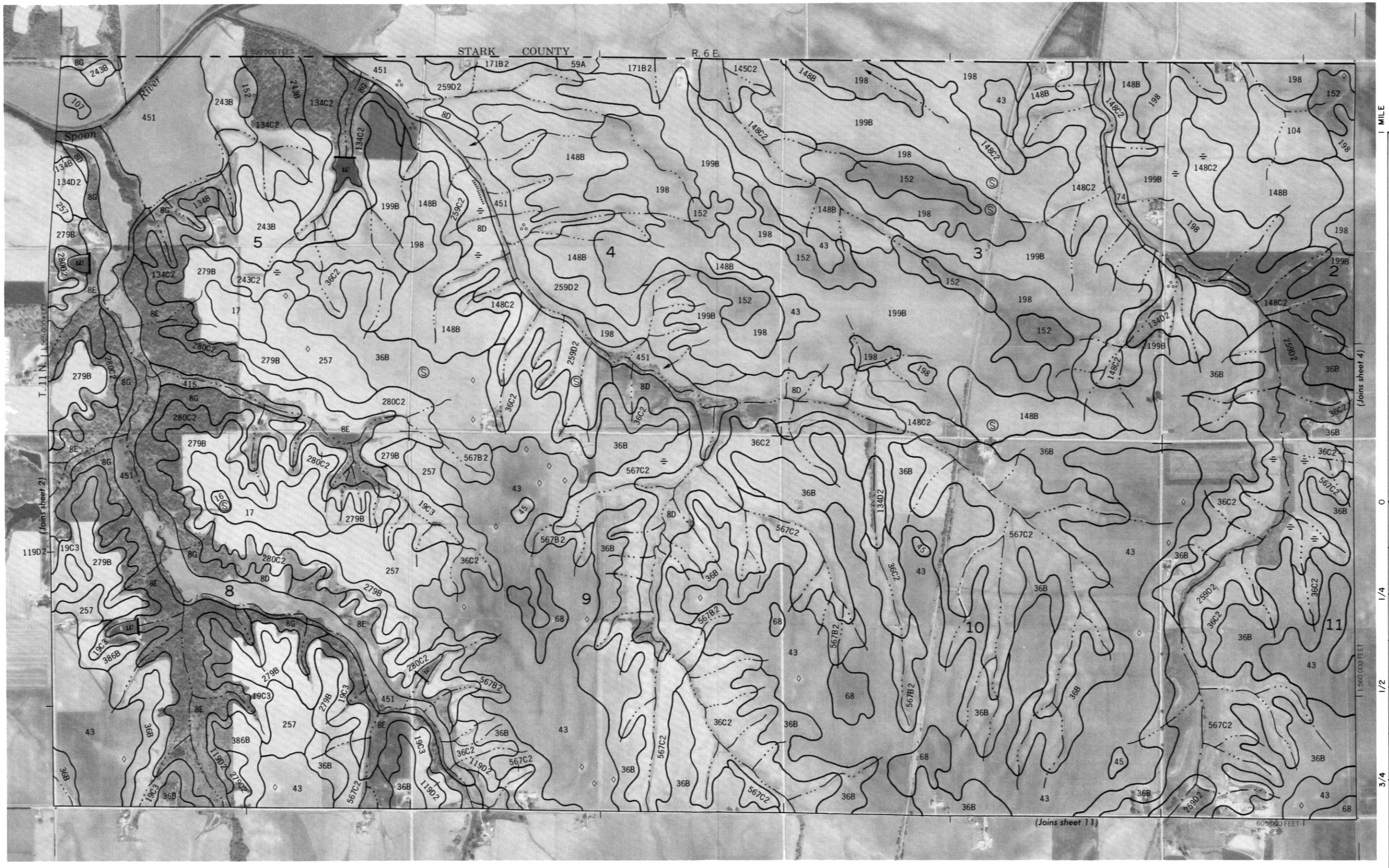
MISCELLANEOUS

- Gravelly spot
- Sandy spot
- Severely eroded spot

PEORIA COUNTY, ILLINOIS — SHEET NUMBER 1




2
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
STARK COUNTY
R. 5 E.
R. 6 E.
SPOON RIVER
SPOON RIVER
1 565 000 FEET
1 560 000 FEET
1 570 000 FEET
(Joins sheet 1)
(Joins sheet 10)
(Joins sheet 3)
T 11 N
1
2
3
6
7
10
11
12


STARK COUNTY
R. 6 E.
T. 11 N.
1 590 000 FEET
1 595 000 FEET
Spoon River
(Joins sheet 2)
(Joins sheet 4)
(Joins sheet 11)
1 560 000 FEET
1 605 000 FEET
5
4
3
2
8
9
10
11
17
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1/4
1/2
3/4
1
N

4

N

1 MILE

1 KILOMETER

Scale 1:15 840

R. 6 E. | R. 7 E.

STARK COUNTY

620 000 FEET

T 11 N.

1 560 000 FEET

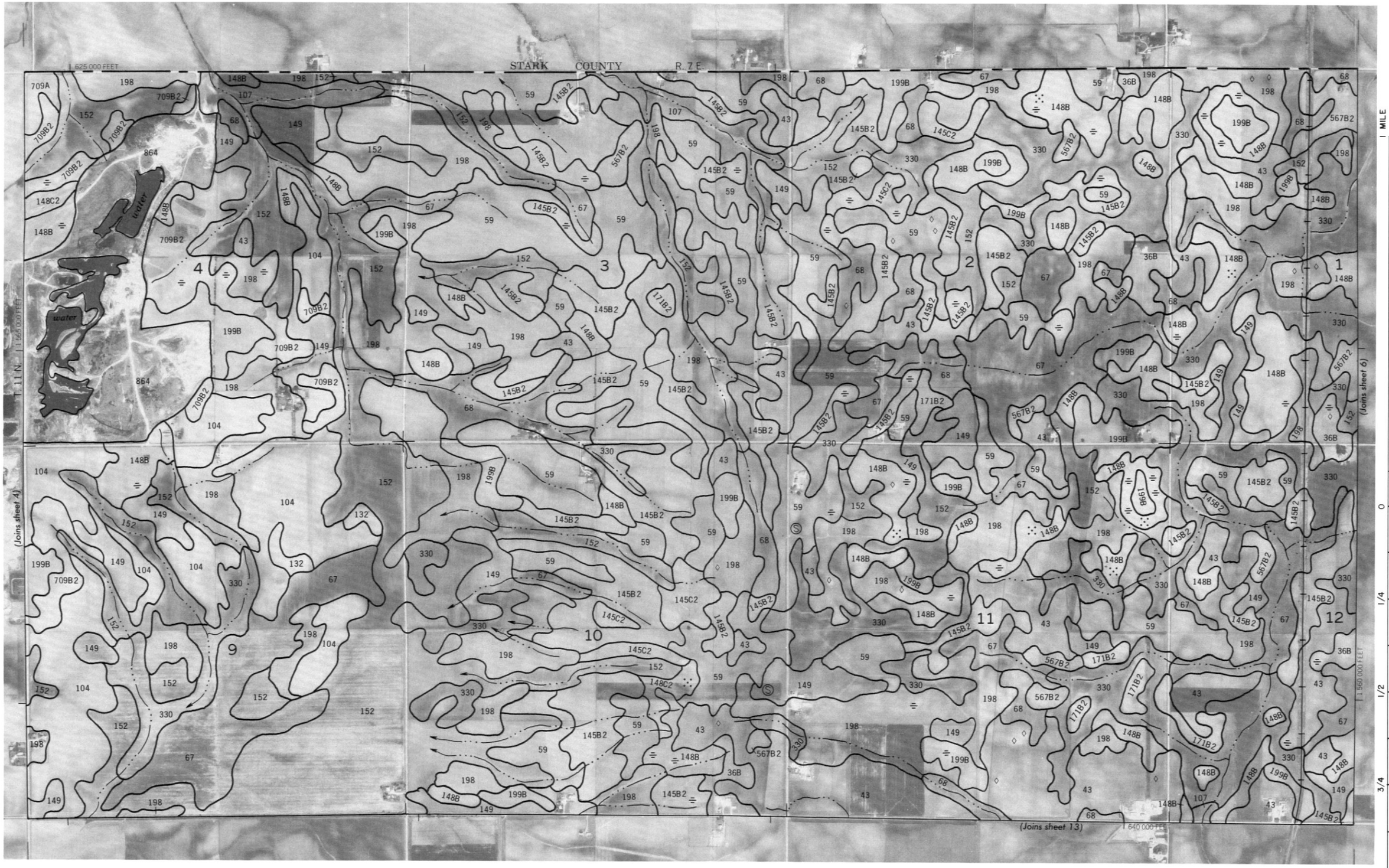
(Joins sheet 3)

(Joins sheet 5)

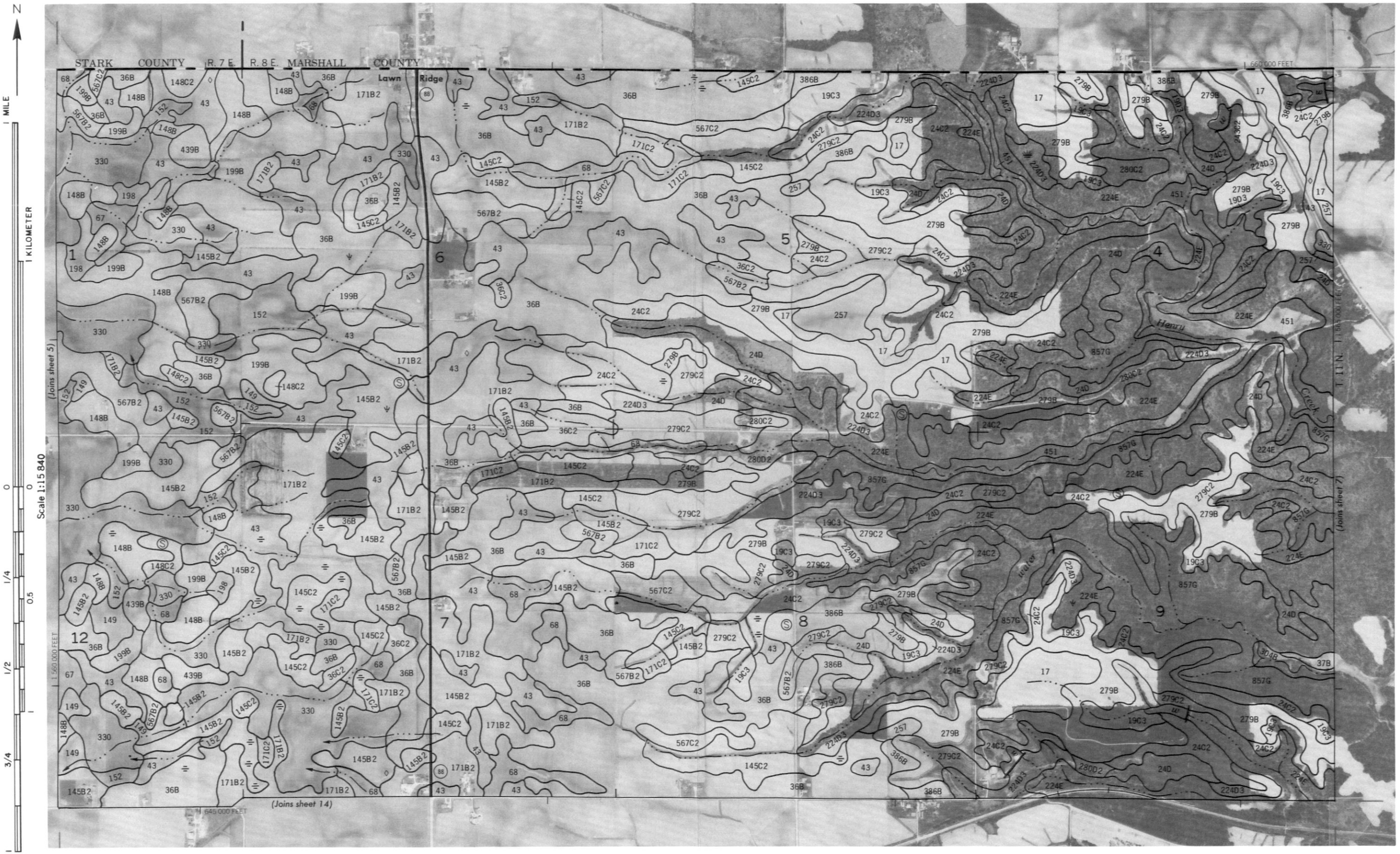
(Joins sheet 12)

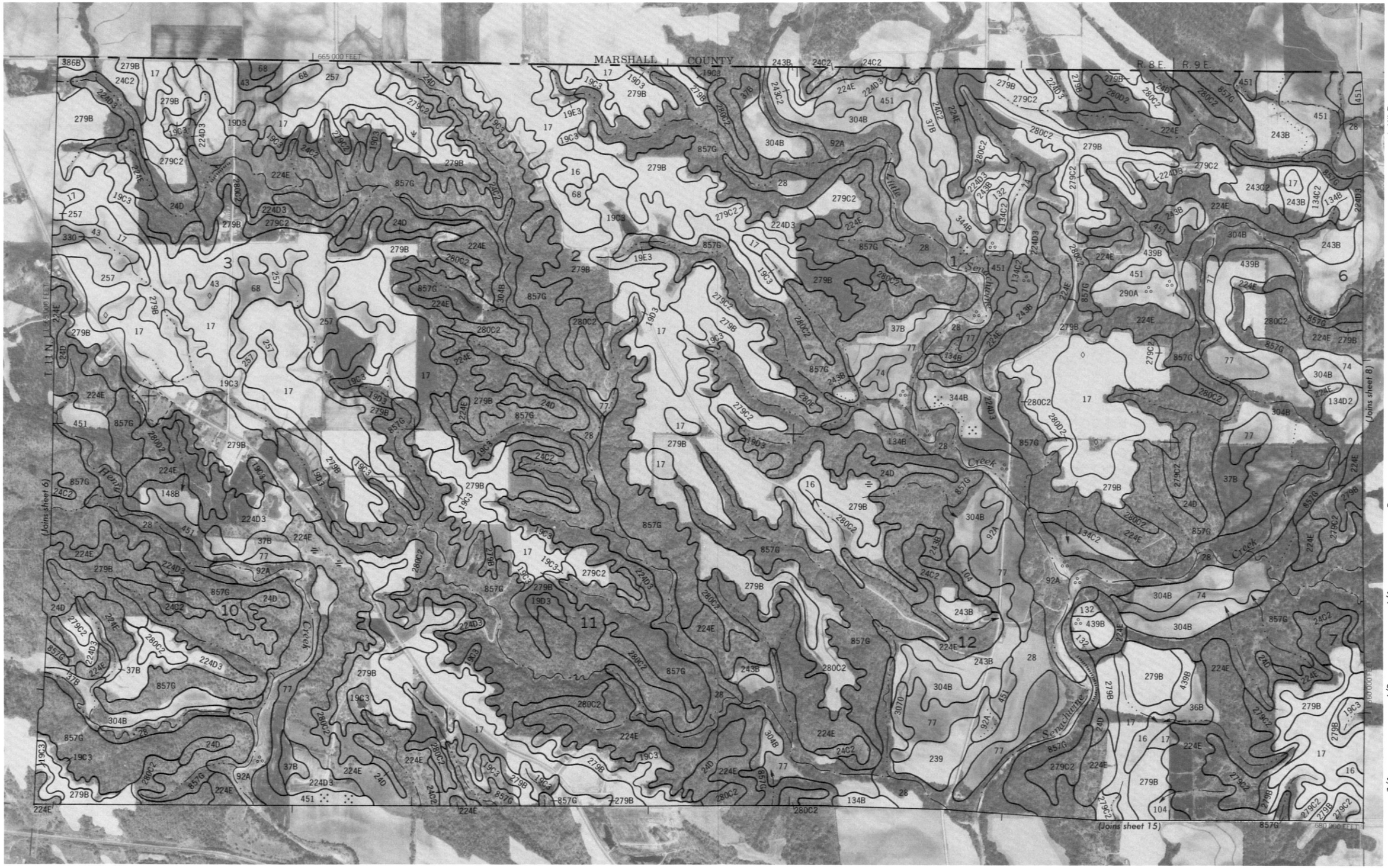
Prince Run

water

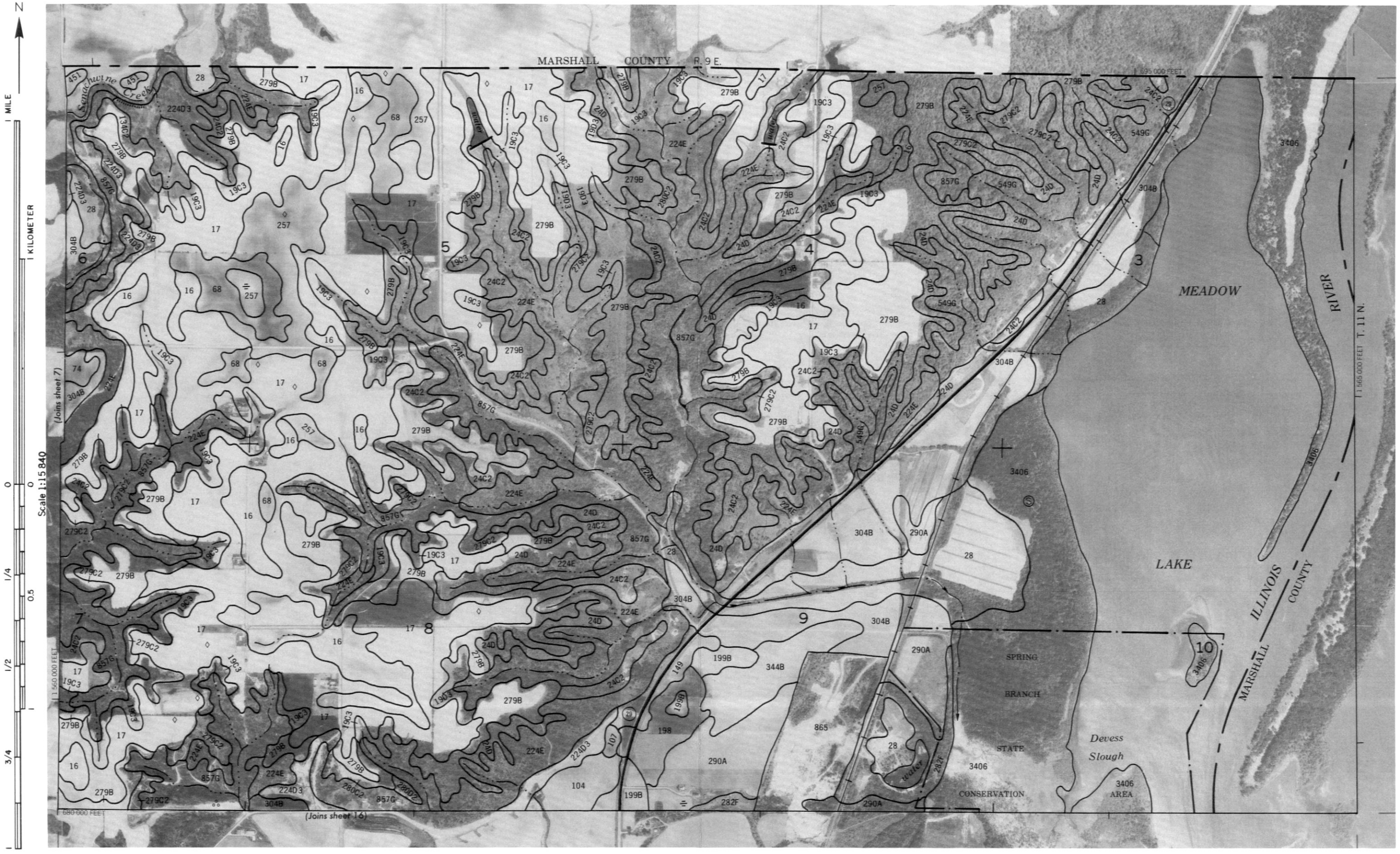

625 000 FEET
STARK COUNTY
R. 7 E.
T. 11 N.
1 565 000 FEET
(Joins sheet 4)
(Joins sheet 6)
(Joins sheet 13)
1 560 000 FEET
1 640 000 FEET
water
water
1
2
3
4
9
10
11
12
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
3/4
1

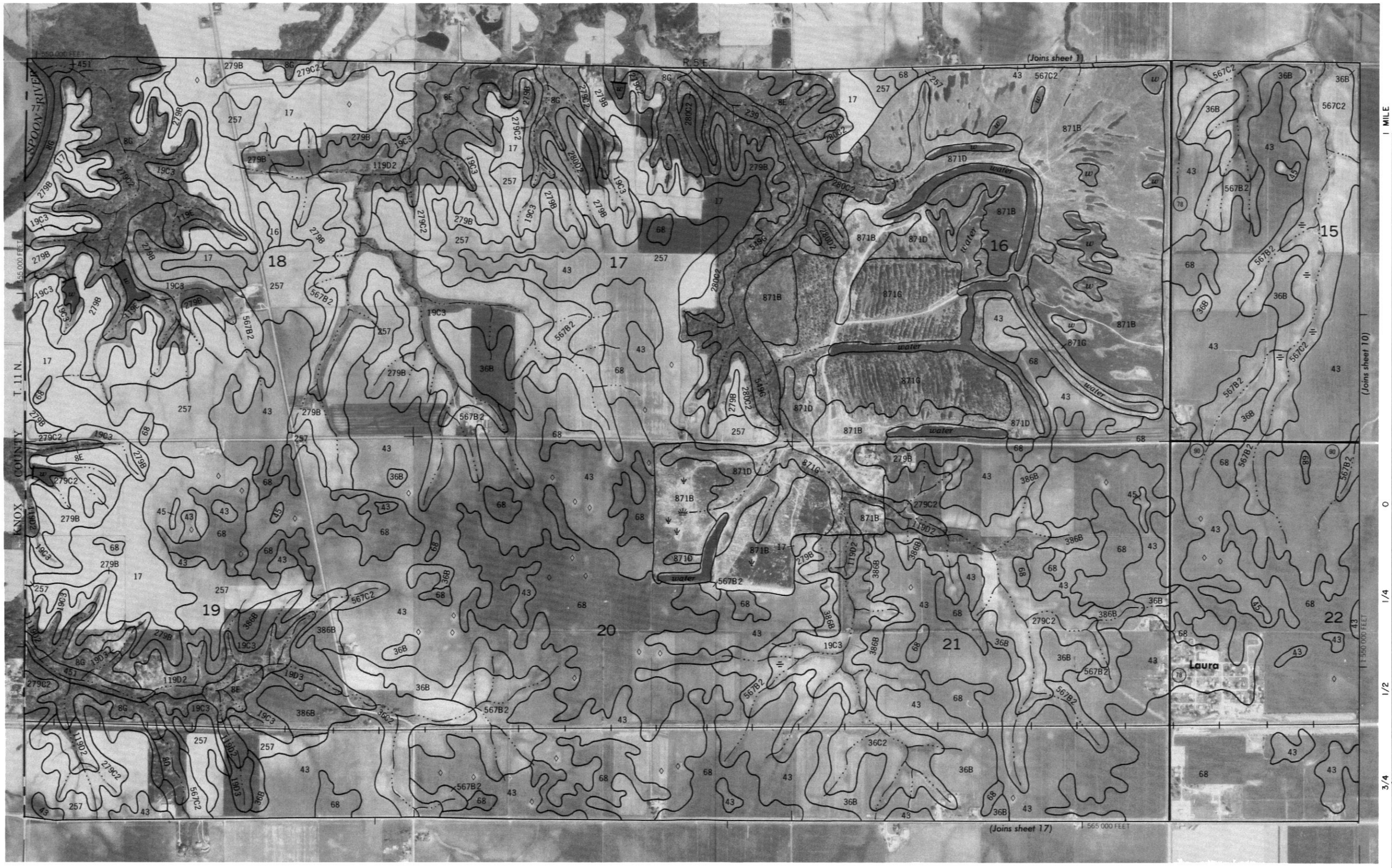
6


N
MILE
KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
STARK COUNTY
R. 7 E.
R. 8 E.
MARSHALL COUNTY
Lawn
Ridge
660 000 FEET
1 560 000 FEET
645 000 FEET
(Joins sheet 5)
(Joins sheet 14)
(Joins sheet 7)
Henry
Creek
1 1/4 N
1
2
3
4
5
6
7
8
9
10
11
12

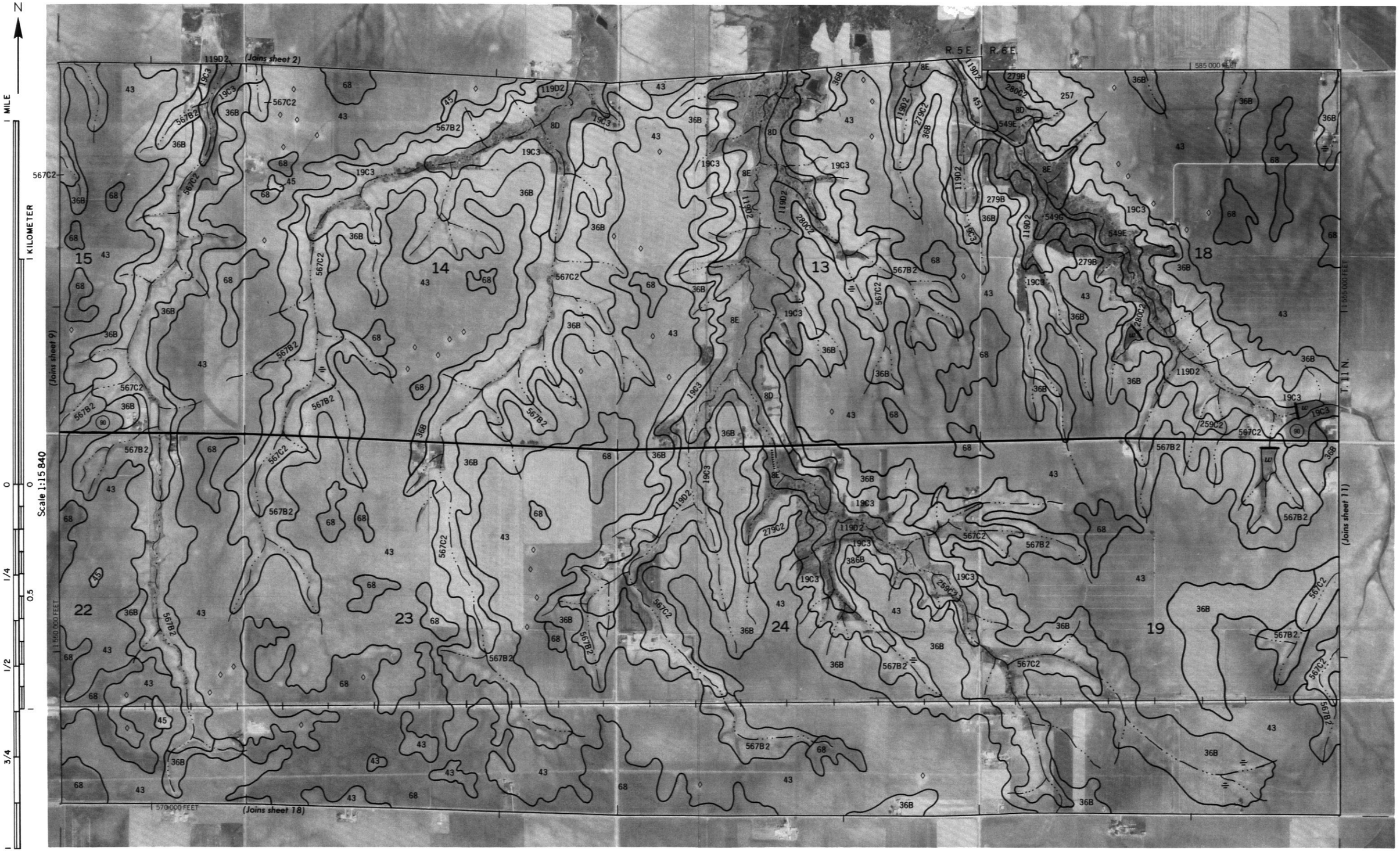

665 000 FEET
MARSHALL COUNTY
R. 8 E.
R. 9 E.
T. 11 N.
(Joins sheet 6)
(Joins sheet 8)
(Joins sheet 15)
Henry Creek
Senachwine Creek
Senachwine
Scale 1:15 840
MILE
KILOMETER

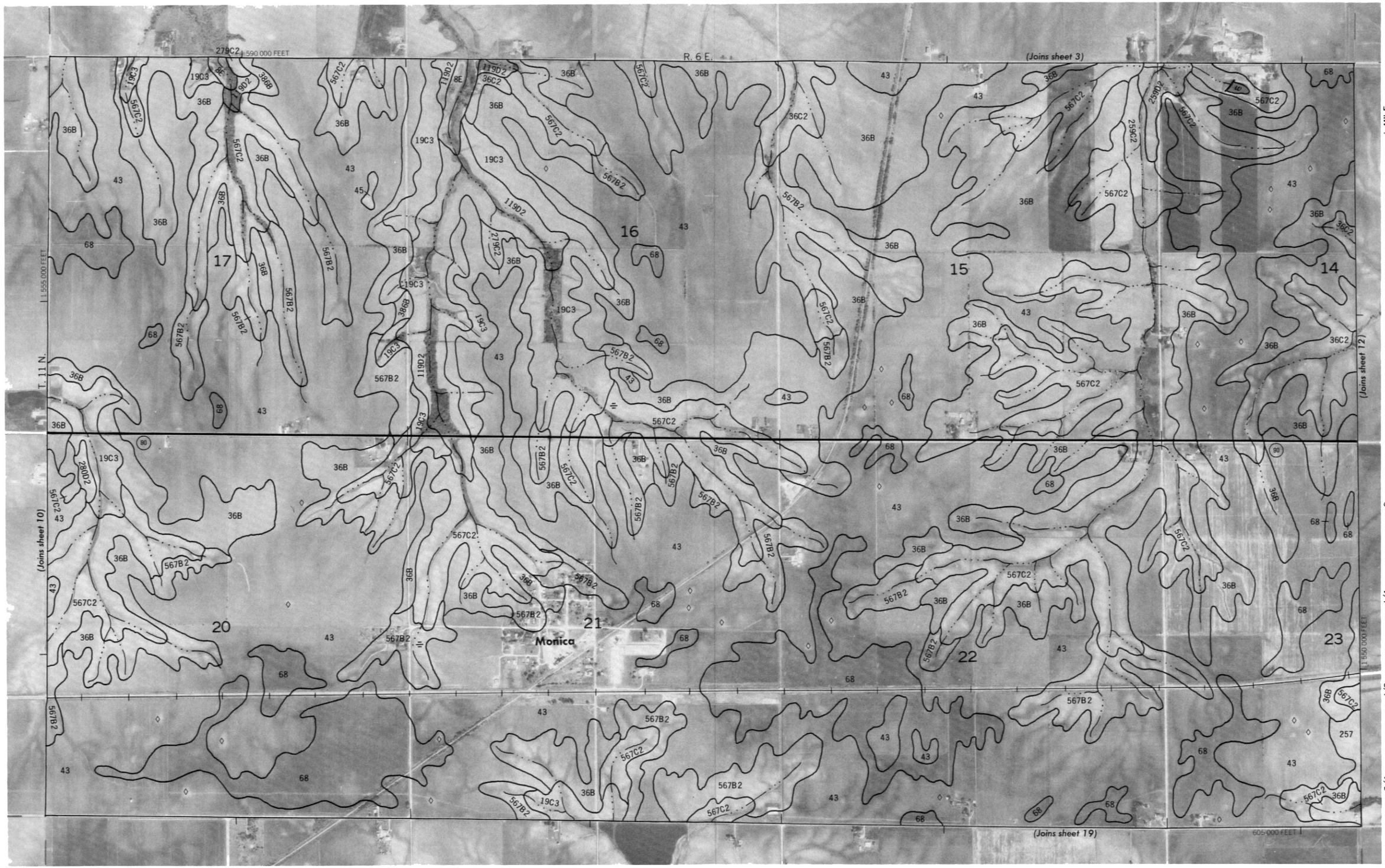
8


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
0.5
1/4
1/2
3/4
1
MARSHALL COUNTY R. 9 E.
T. 11 N.
695 000 FEET
680 000 FEET
565 000 FEET
560 000 FEET
Senachwine Creek
(Joins sheet 7)
(Joins sheet 16)
MEADOW
RIVER
LAKE
SPRING
BRANCH
STATE
CONSERVATION
AREA
Devess
Slough
ILLINOIS
MARSHALL
COUNTY
5
4
3
6
7
8
9
10


R. 5 E.
T. 11 N.
KNOX COUNTY
SPOON RIVER
(Joins sheet 1)
(Joins sheet 10)
(Joins sheet 17)
water
Laura
17
18
19
20
21
22
16
15
279B
279C2
19C3
119D2
119E
257
567B2
567C2
36B
43
68
871B
871D
871G
280D2
386B
36C2
8G
8E
549C
MILE
KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
3/4
1
N

10


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
0.5
1
1/4
1/2
3/4
1
R. 5 E.
R. 6 E.
T. 11 N.
585 000 FEET
555 000 FEET
550 000 FEET
570 000 FEET
(Joins sheet 2)
(Joins sheet 9)
(Joins sheet 11)
(Joins sheet 18)
15
14
13
18
22
23
24
19
119D2
19C3
567C2
567B2
36B
43
68
45
8D
8E
279B
280C2
549E
257
259C2
386B
279C2
451



11

N

1 MILE

1 KILOMETER

Scale 1:15 840

0 0 1/4 0.5 1/2 1 3/4 1

12

N

Scale 1:15 840

1 MILE 0 1/4 1/2 3/4 1

1 KILOMETER 0 0.5 1

R. 6 E. R. 7 E.

T. 11 N.

620 000 FEET

1 565 000 FEET

1 550 000 FEET

610 000 FEET

(Joins sheet 4)

(Joins sheet 11)

(Joins sheet 13)

(Joins sheet 20)

Princeville

Prince Run

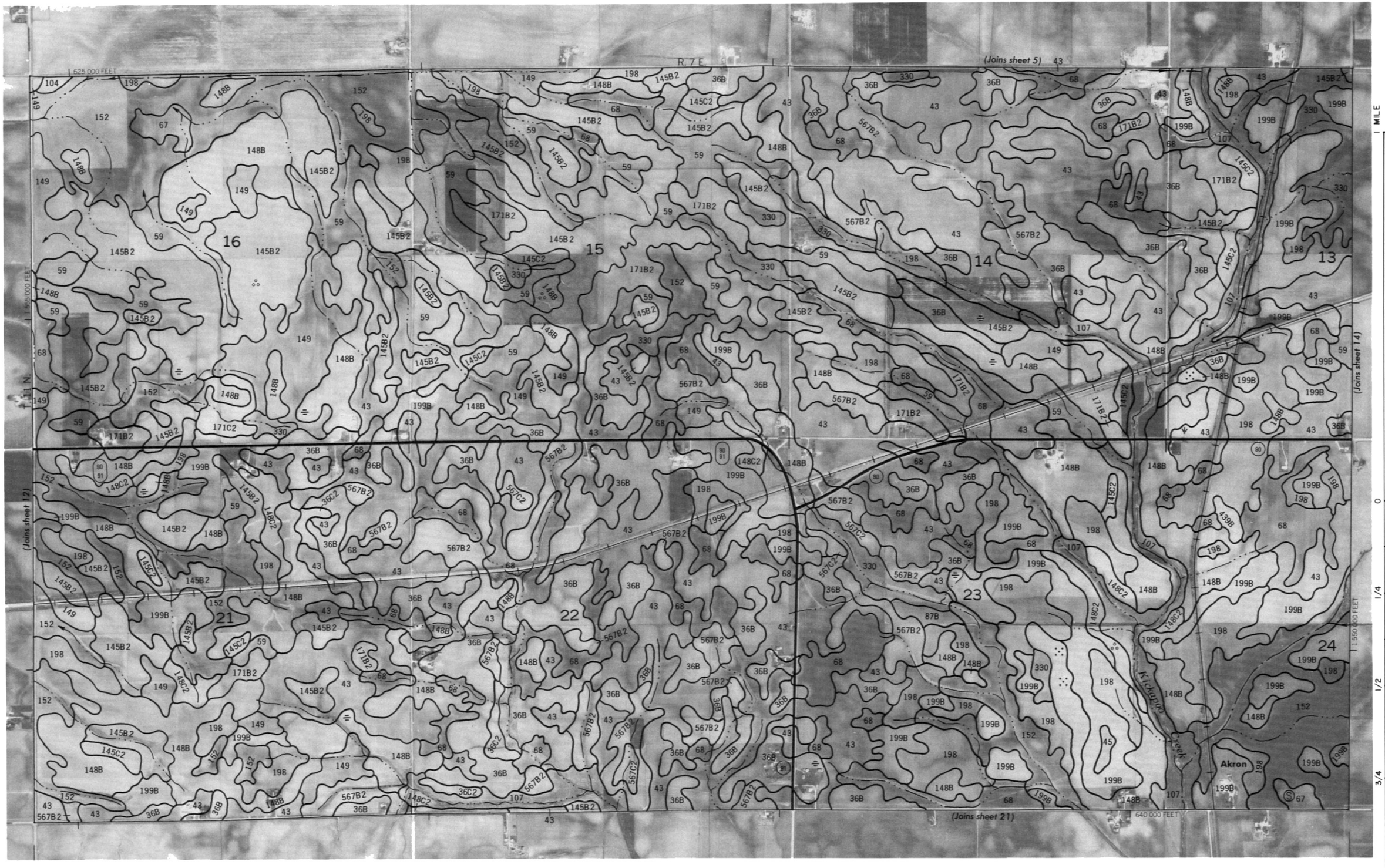
SEWAGE LAGOON

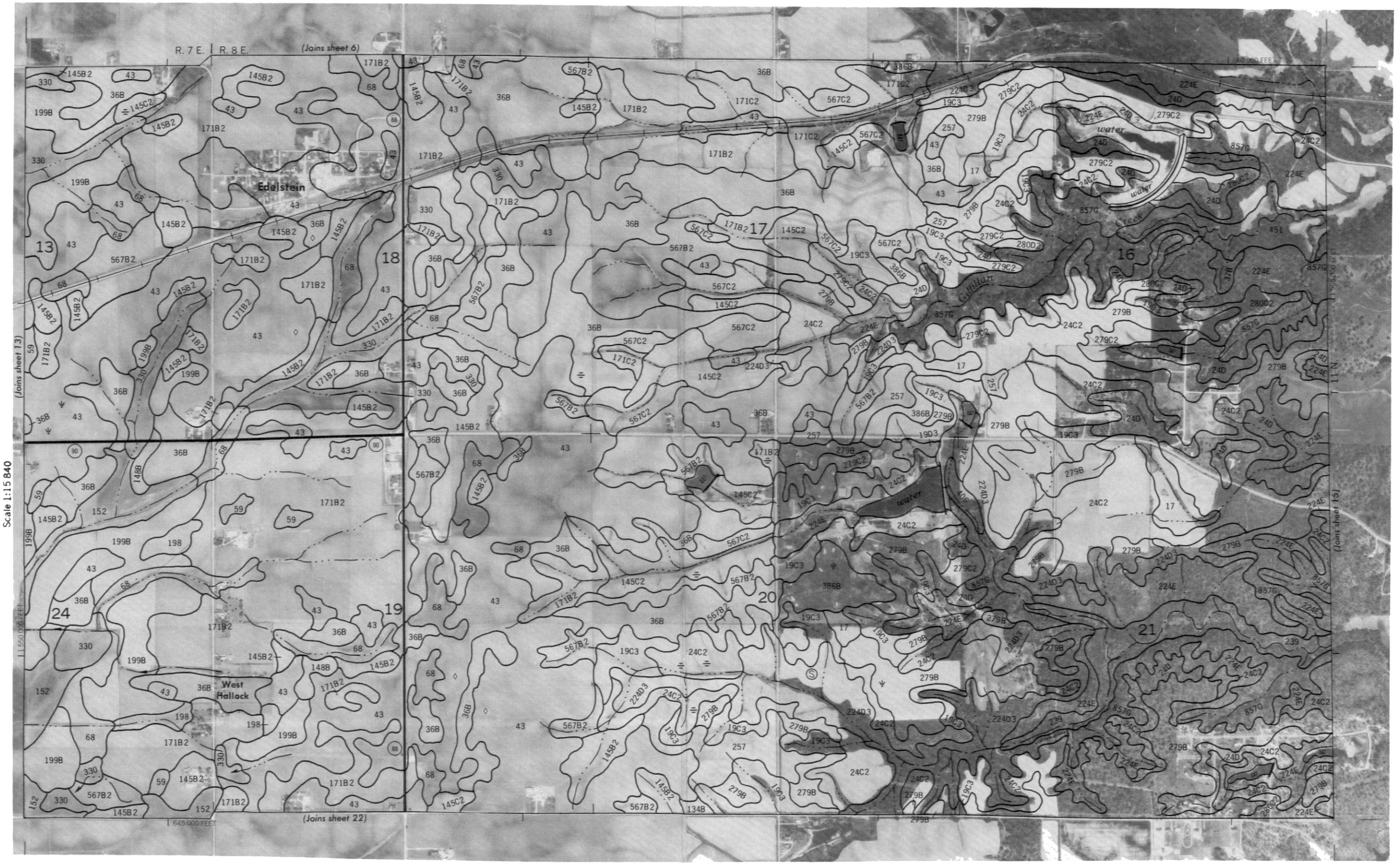
SEWAGE LAGOON

CEMETERY

water

14 13 18 17 23 24 19 20


R. 7 E.
(Joins sheet 5)
625 000 FEET
1 456 000 FEET
T. 11 N.
16
15
14
13
21
22
23
24
Akron
Kickapoo Creek
(Joins sheet 12)
(Joins sheet 14)
(Joins sheet 21)
640 000 FEET
1 950 000 FEET
N
1 MILE
1 KILOMETER
Scale 1:15 840


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
1
R. 7 E.
R. 8 E.
(Joins sheet 6)
(Joins sheet 13)
(Joins sheet 22)
(Joins sheet 15)
Edelstein
West Hallock
13
18
17
16
24
19
20
21
T 11 N
1 650 000 FEET
645 000 FEET
water
Creek


665 000 FEET
950 000 FEET
680 000 FEET
(Joins sheet 7)
(Joins sheet 14)
(Joins sheet 16)
(Joins sheet 23)
R. 8 E.
R. 9 E.
T. 11 N.
15
14
13
18
17
23
24
22
19
Henry
Creek
Gilfillan Creek
Senachwine Creek
Hallock Creek
North Hampton
SEWAGE LAGOON
water
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
3/4
1

16


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4
1 550 000 FEET
680 000 FEET
695 000 FEET
565 000 FEET
R. 9 E.
T. 11 N.
(Joins sheet 8)
(Joins sheet 15)
(Joins sheet 24)
Creek
Senachwine
SPRING BRANCH STATE CONSERVATION AREA
RIVER
ILLINOIS
MARSHALL COUNTY
WOODFORD COUNTY
CHILLICOTHE
water
18
17
16
15
19
20
21
279C2
279B
24D
224E
224D3
857G
304B
107
28
132
104
198B
290A
282A
406
865
439B
3406
37B
439B
290A
2802B
533
92A
2290A


550 000 FEET
R. 5 E.
(Joins sheet 9)
548 000 FEET
T. 11 N.
KNOX COUNTY
30
29
28
27
31
32
33
34
Creek
French
Creek
565 000 FEET
(Joins sheet 25)
(Joins sheet 18)
1 540 000 FEET
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
1
3/4

18

N

Scale 1:15 840

1 MILE

1 KILOMETER

(Joins sheet 10)

R. 5 E. | R. 6 E.

585 000 FEET

545 000 FEET

T. 11 N.

(Joins sheet 17)

(Joins sheet 19)

(Joins sheet 26)

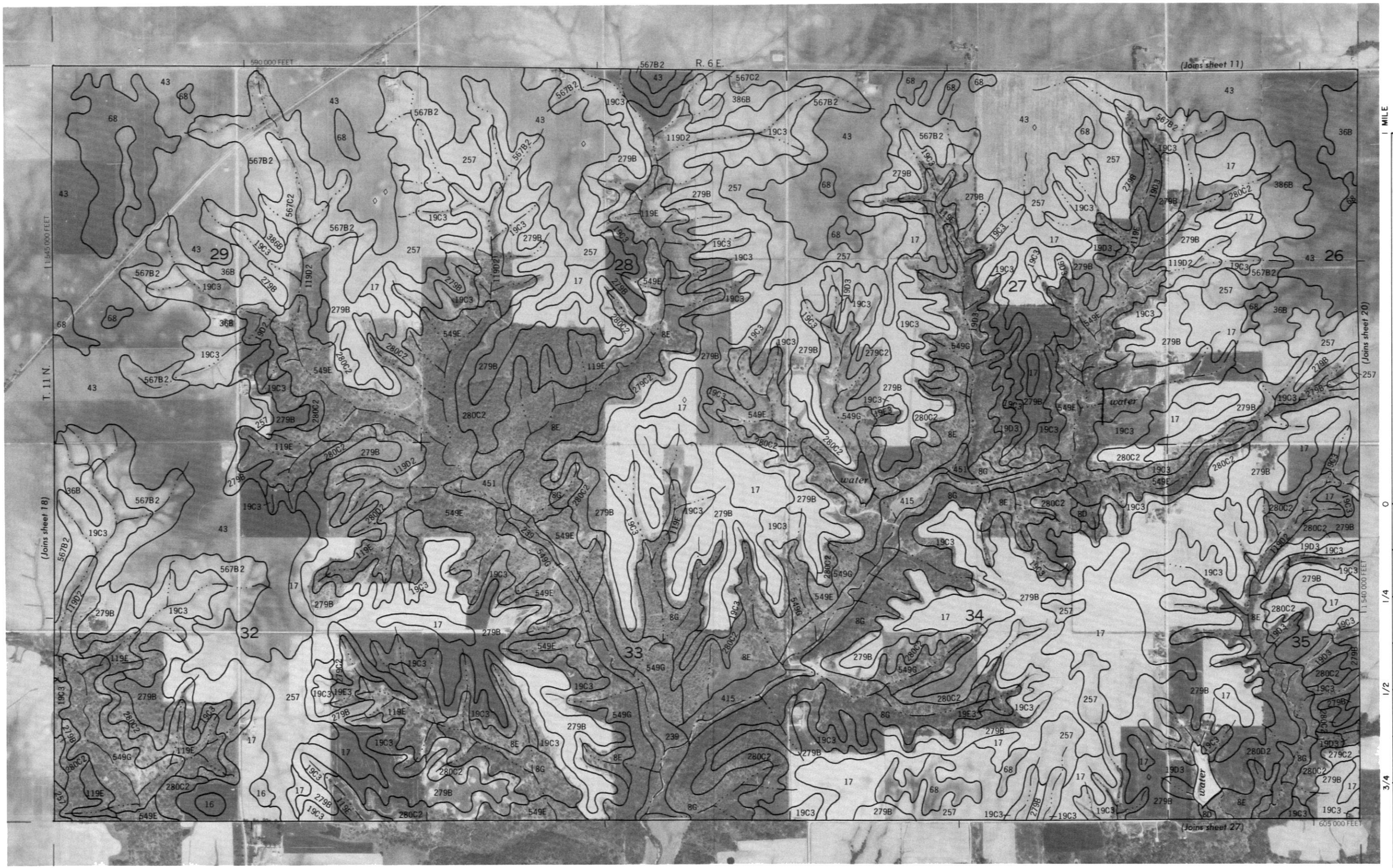
570 000 FEET

1 000 000 FEET

27 26 25 30

34 35 36 31

43 45 68 36B 567B2 567C2 19C3 119D2 279B 257


590 000 FEET
R. 6 E.
(Joins sheet 11)
T. 11 N.
1 545 000 FEET
(Joins sheet 18)
(Joins sheet 20)
(Joins sheet 27)
1 605 000 FEET
1 540 000 FEET
29
28
27
26
32
33
34
35
water
N
MILE
KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
1
3/4

20

N

Scale 1:15 840

1 MILE

1 KILOMETER

(Joins sheet 12)

R. 6 E. R. 7 E.

620 000 FEET

549 000 FEET

T. 11 N.

(Joins sheet 19)

(Joins sheet 21)

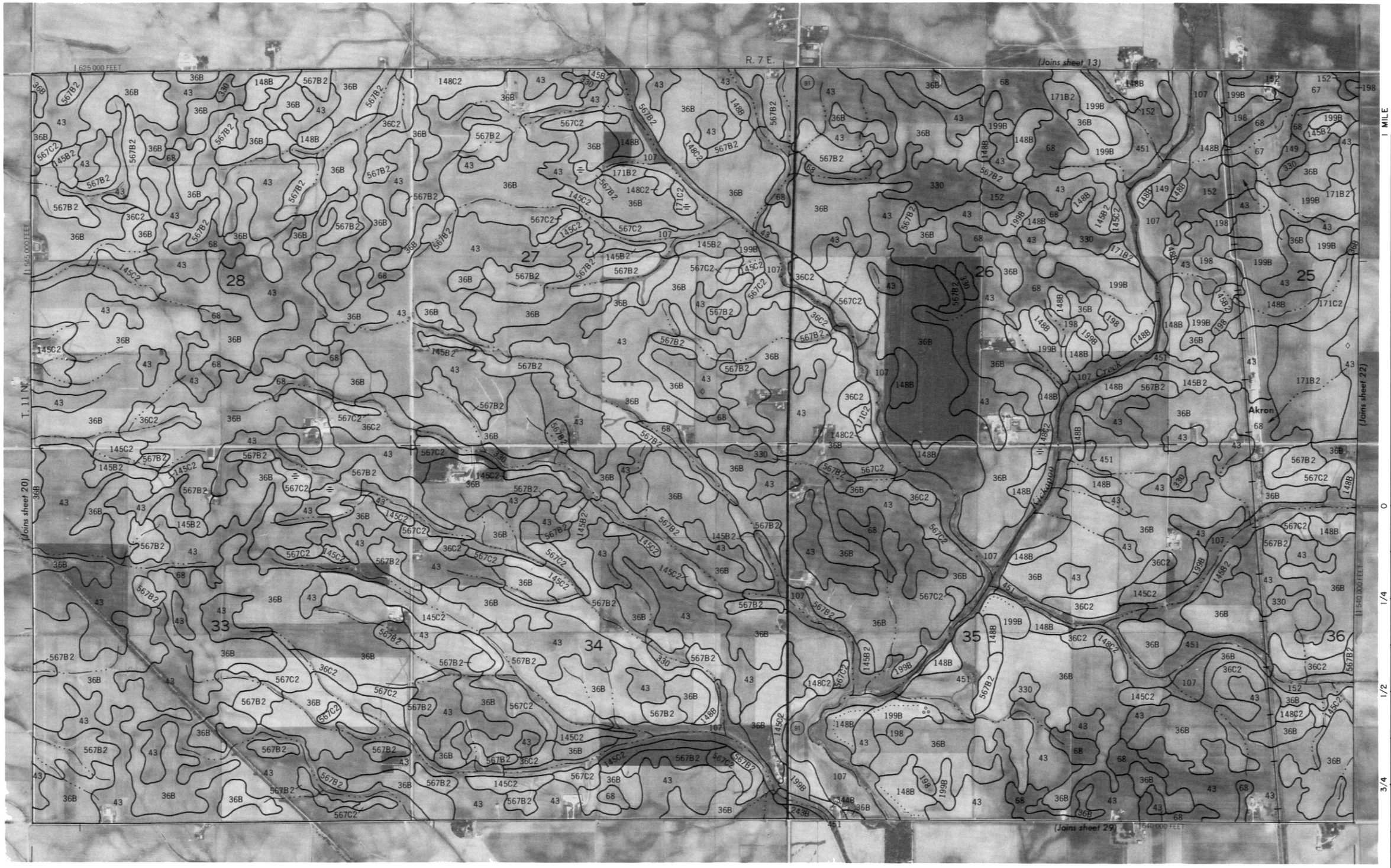
(Joins sheet 28)

610 000 FEET

540 000 FEET

26 25 30 29 35 36 31 32

43 257 279B 567B2 567C2 36B 68 19C3 19D3 279C2 280C2 8D 8E 119D2 36C2 386B 567B2 17 19E3 171C2 145C2 330 224D3


R. 7 E.
T. 11 N.
625 000 FEET
1 645 000 FEET
(Joins sheet 13)
(Joins sheet 20)
(Joins sheet 22)
(Joins sheet 29)
1 640 000 FEET
Akron
Creek
27
28
26
25
33
34
35
36
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
3/4

22

N

1 MILE

1 KILOMETER

Scale 1:15 840

0 0 1/4 0.5 1/2 3/4 1

R. 7 E. R. 8 E.

T 11 N

(Joins sheet 14)

(Joins sheet 21)

(Joins sheet 23)

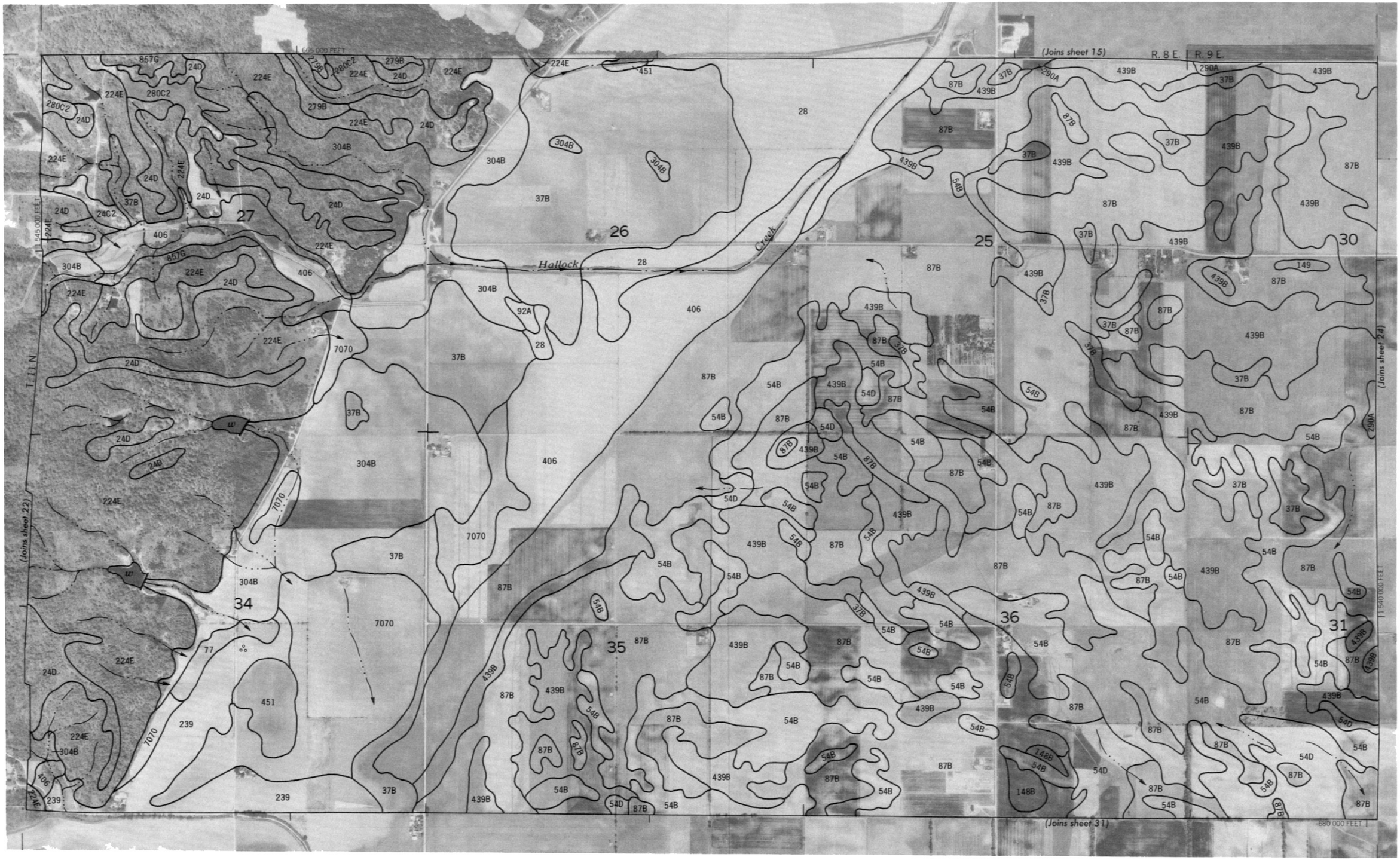
(Joins sheet 30)

1 540 000 FEET

645 000 FEET

Hallock Creek

25 30 29 28 36 31 32 33


665 000 FEET
545 000 FEET
T. 11 N.
R. 8 E.
R. 9 E.
(Joins sheet 15)
(Joins sheet 22)
(Joins sheet 24)
(Joins sheet 31)
680 000 FEET
540 000 FEET
Hallock Creek
27
26
25
30
34
35
36
31
857G
24D
224E
280C2
279B
304B
37B
406
28
451
87B
439B
290A
149
92A
7070
54B
54D
148B
77
239
MILE
KILOMETER
Scale 1:15 840
0
1/4
1/2
3/4
0.5

24

N

1 MILE

1 KILOMETER

Scale 1:15 840

(Joins sheet 16)

R. 9 E.

695 000 FEET

1 545 000 FEET

CHILLICOTHE

CEMETERY

RIVER

ILLINOIS

WOODFORD COUNTY

T. 11 N.

T. 10 N.

(Joins sheet 23)

(Joins inset)

685 000 FEET

(Joins lower left)

(Joins sheet 31)

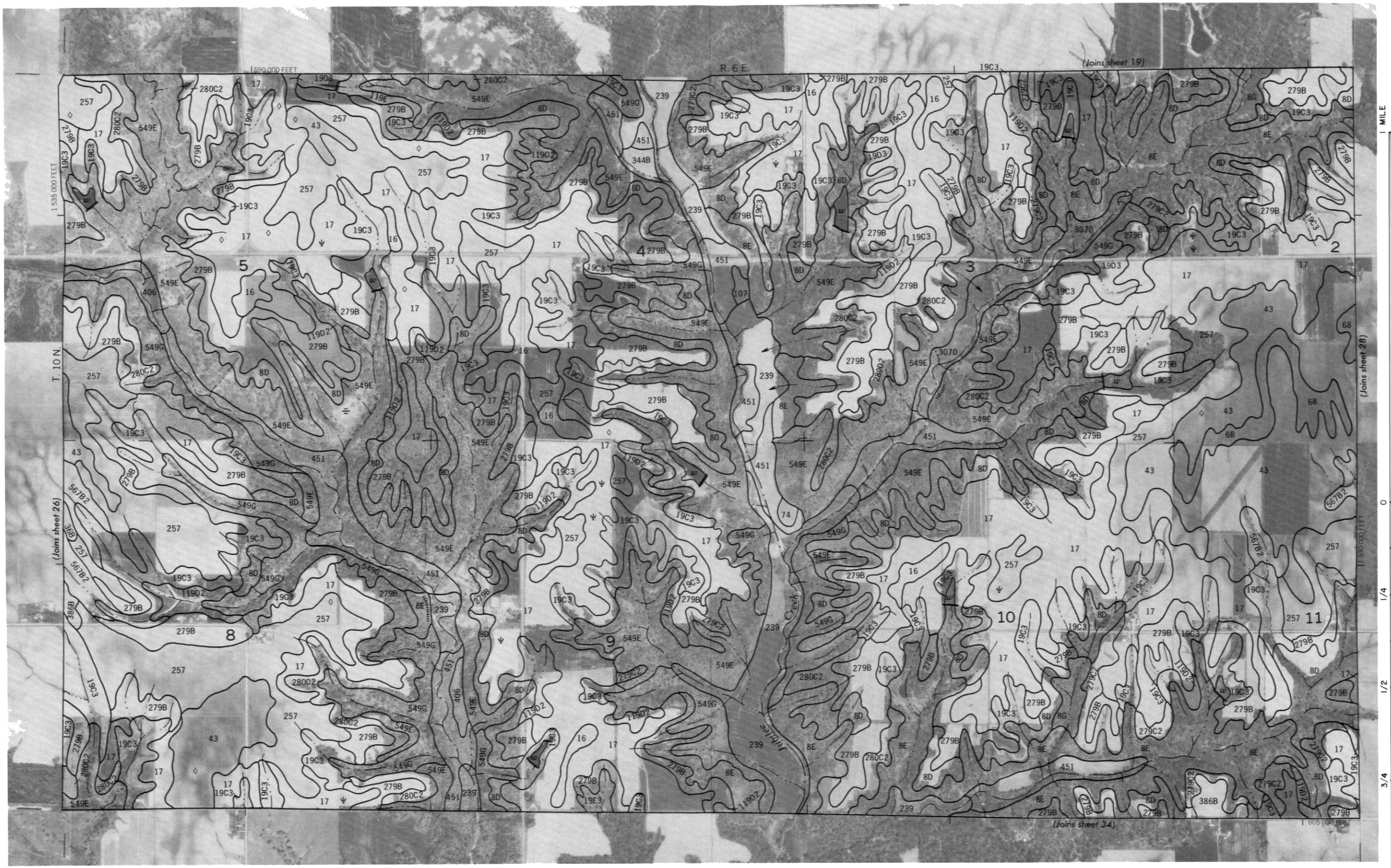
ROME

4000 AND 5000-FOOT GRID TICKS


555 000 FEET
R. 5 E.
(Joins sheet 17)
535 000 FEET
T. 10 N.
COUNTY
KNOX
(Joins sheet 26)
565 000 FEET
(Joins sheet 32)
French Creek
Swab Run
1 MILE
1 KILOMETER
Scale 1:15 840
1 530 000 FEET
N

26


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
3/4
1
(Joins sheet 18)
(Joins sheet 25)
(Joins sheet 27)
(Joins sheet 33)
R. 5 E.
R. 6 E.
T. 10 N.
585 000 FEET
570 000 FEET
530 000 FEET
540 000 FEET
water
567B2
567C2
36B
36C2
43
45
68
119D2
19C3
279B
279C2
280C2
257
386B
549E
549G
406
1
2
3
6
7
10
11
12


590,000 FEET
535,000 FEET
R. 6 E.
T. 10 N.
(Joins sheet 19)
(Joins sheet 28)
(Joins sheet 26)
(Joins sheet 34)
Creek
Scale 1:15 840
1 MILE
1 KILOMETER

28

N

1 MILE

1 KILOMETER

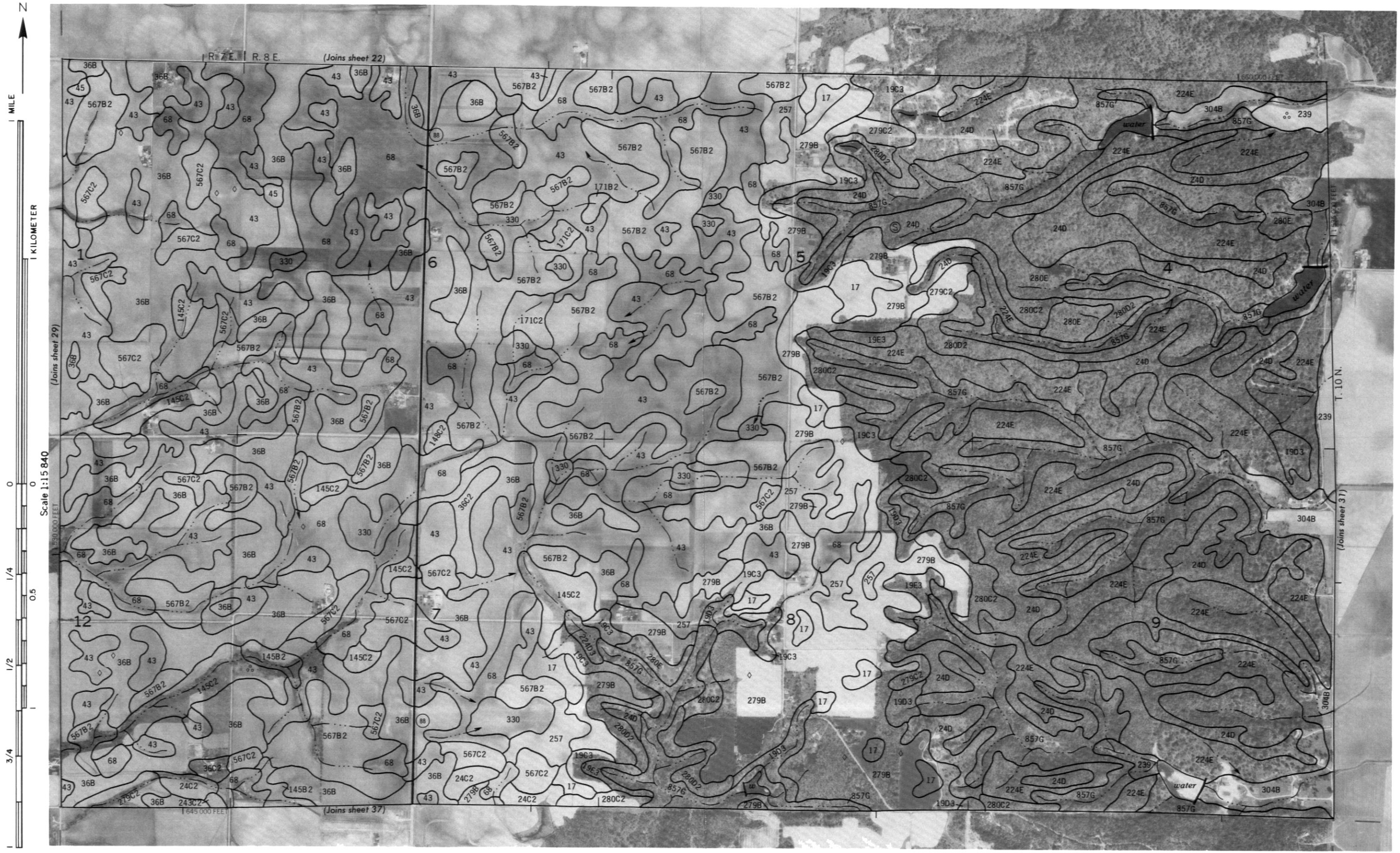
Scale 1:15 840

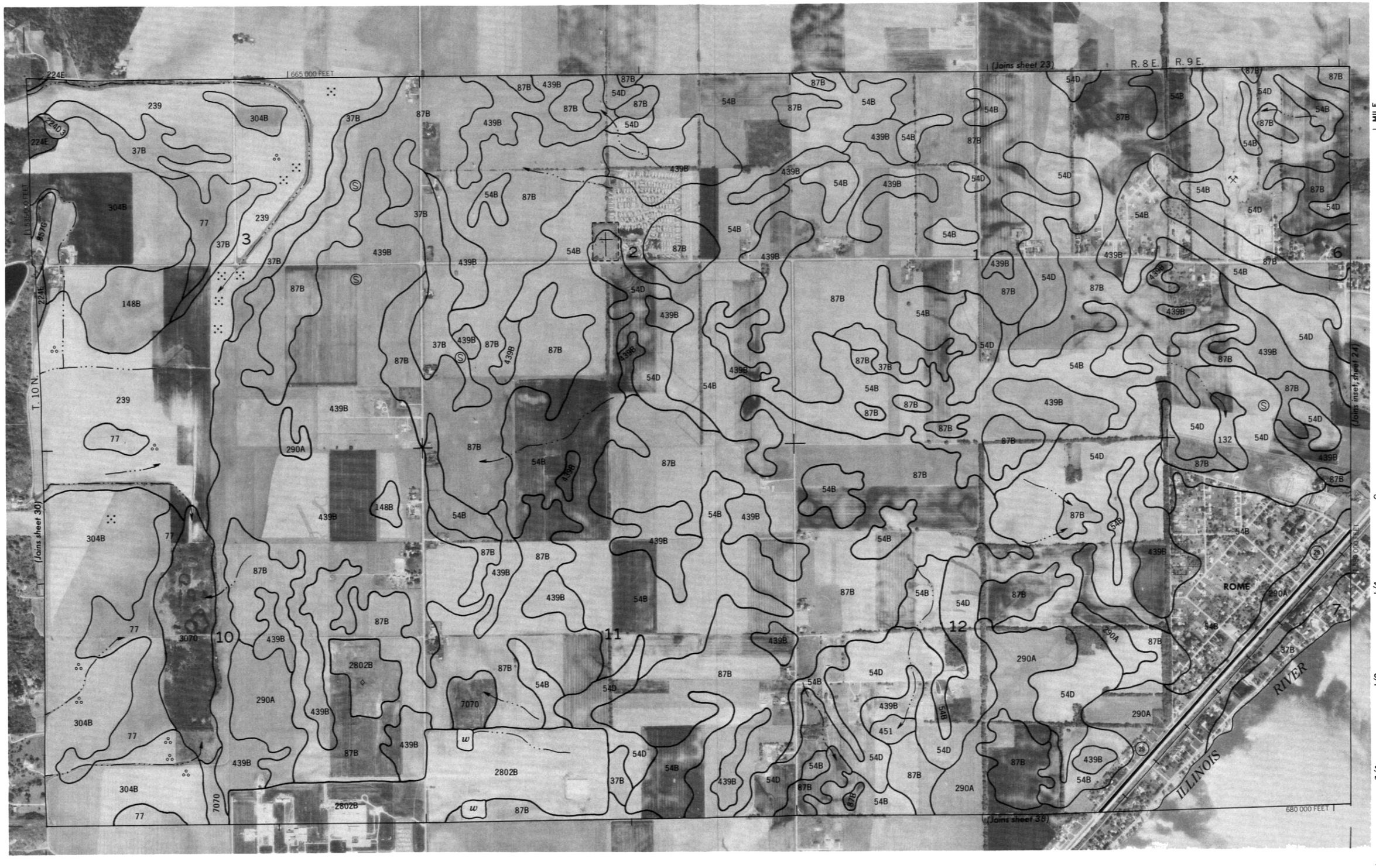
0 0.5 1

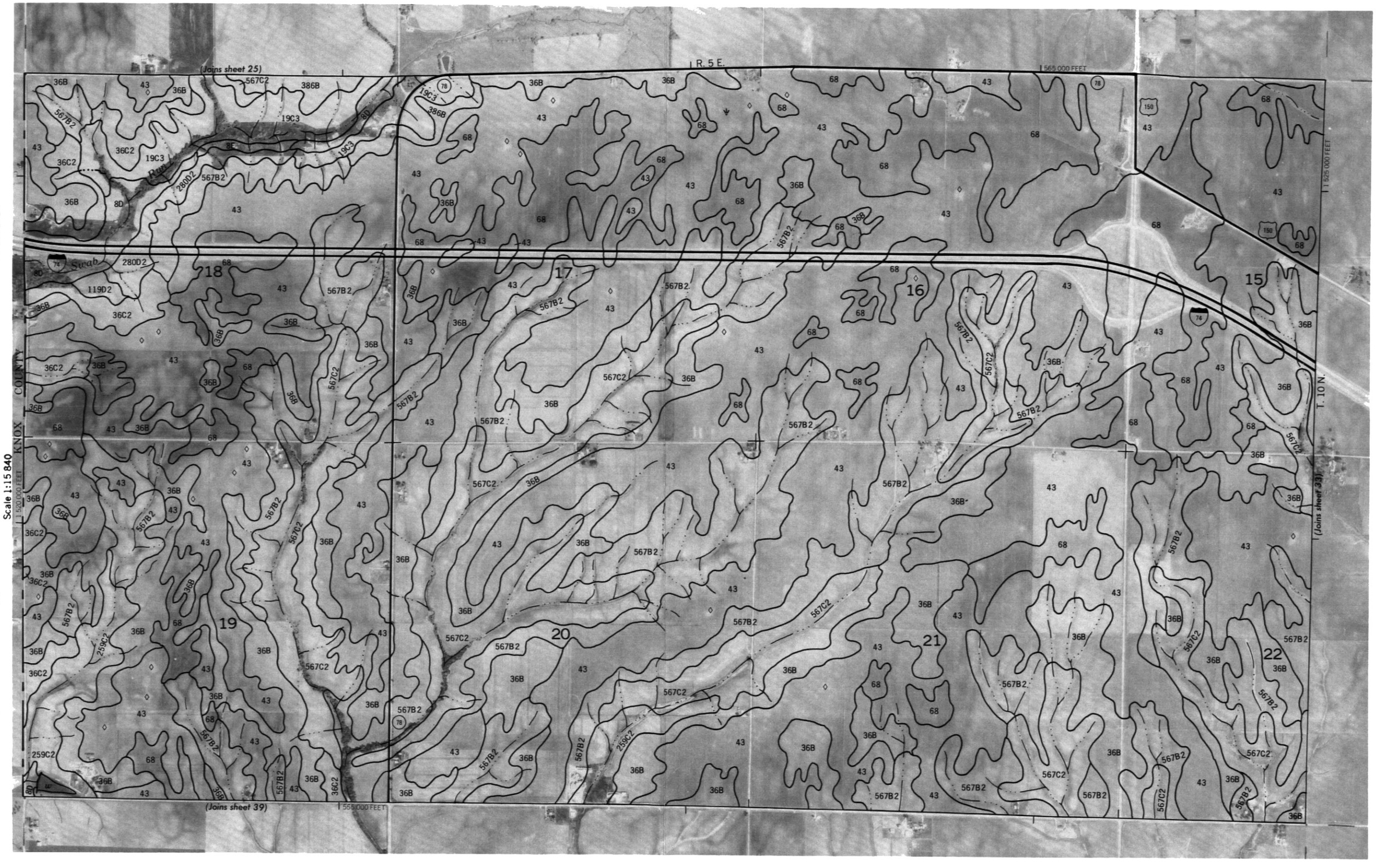
1/4 1/2 3/4

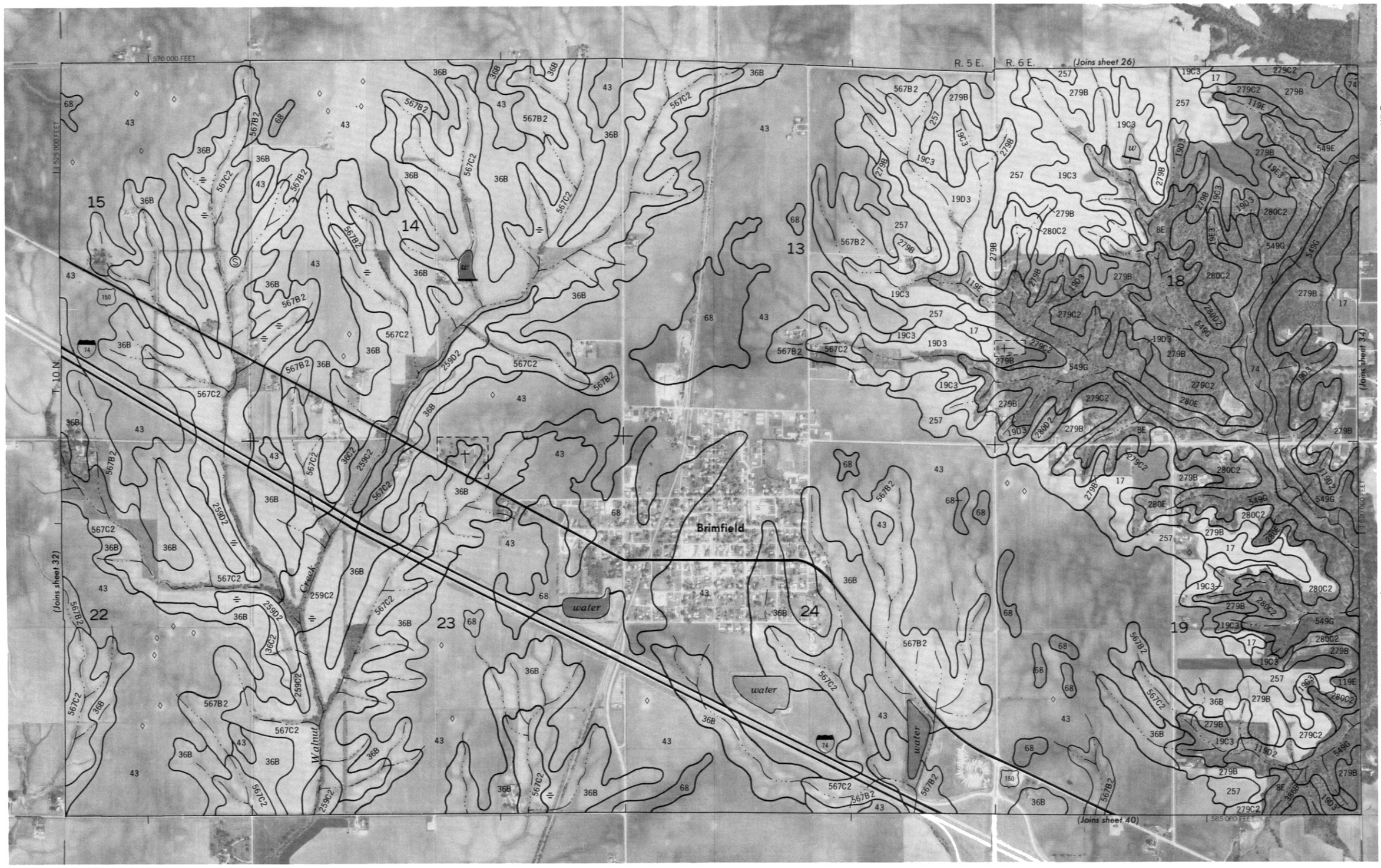


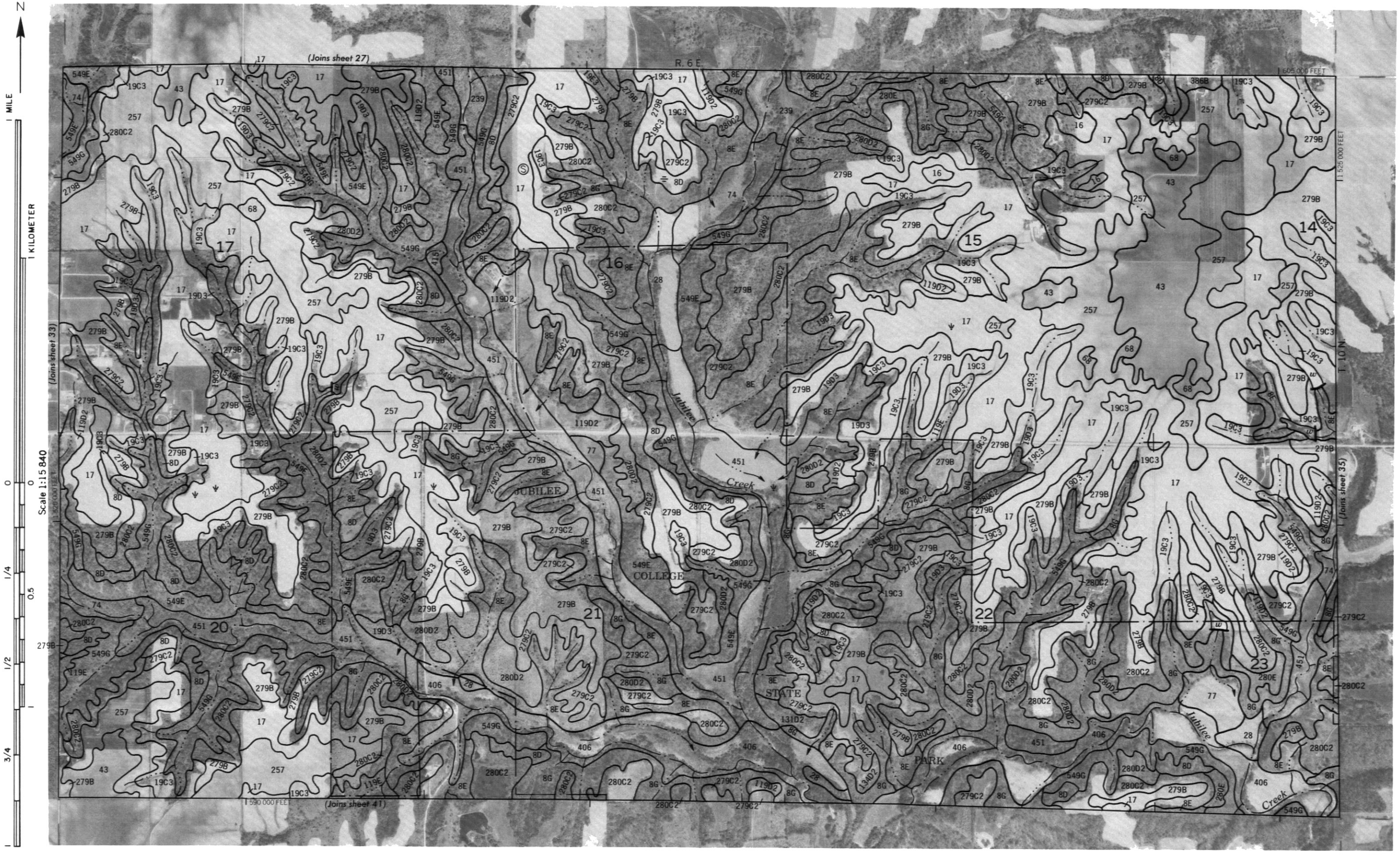

625 000 FEET
R. 7 E.
(Joins sheet 21)
535 000 FEET
T. 10 N.
(Joins sheet 28)
(Joins sheet 30)
(Joins sheet 36)
640 000 FEET
530 000 FEET
SEWAGE LAGOON
Dunlap
Kickapoo Creek
N
1 MILE
1 KILOMETER
Scale 1:15 840

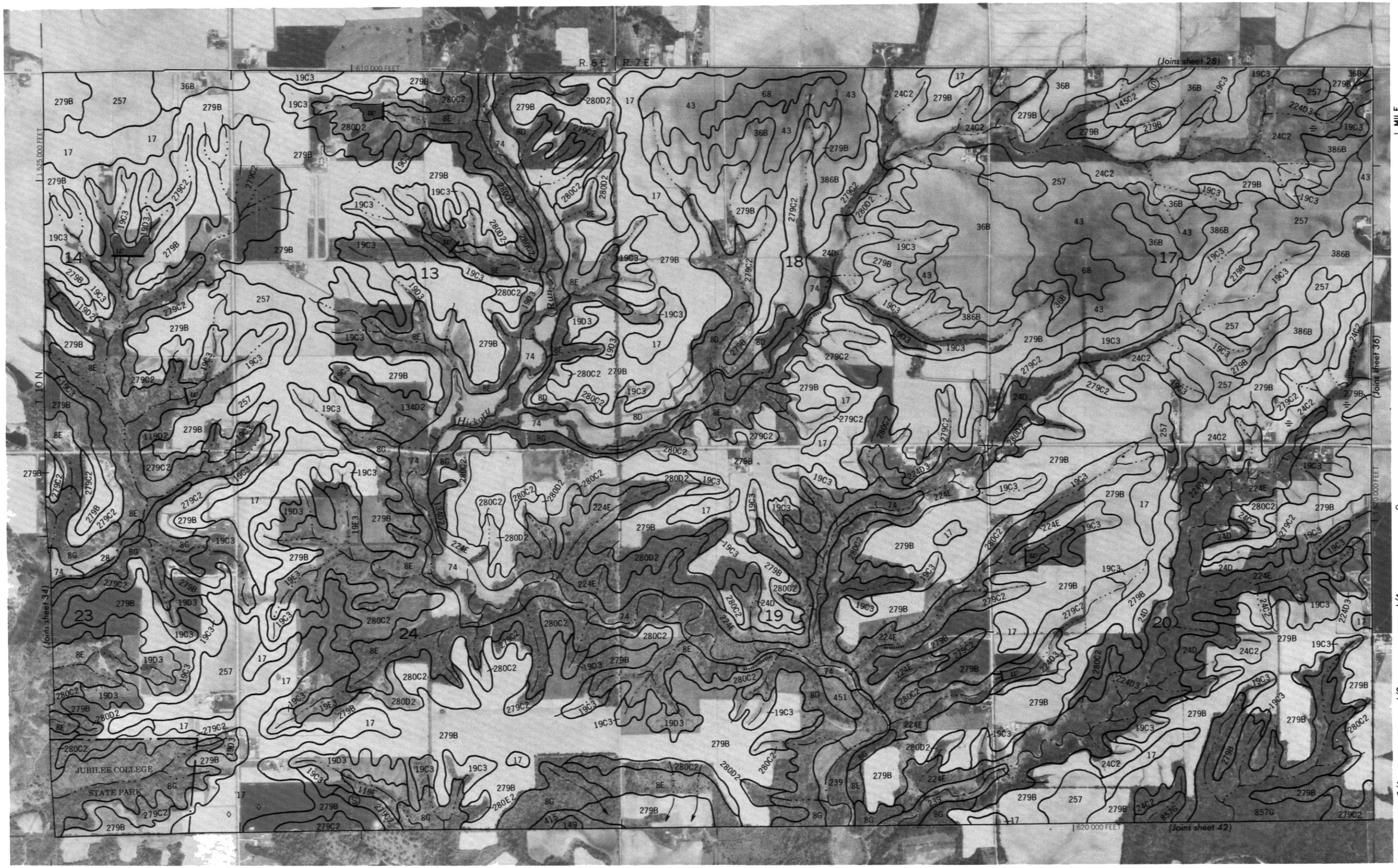

N
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
1
3/4
R. 7 E.
R. 8 E.
(Joins sheet 22)
(Joins sheet 29)
(Joins sheet 37)
(Joins sheet 31)
T. 10 N.
1650000 FEET
1645000 FEET
water
1
6
5
4
12
7
8
9


665 000 FEET
(Joins sheet 23)
R. 8 E.
R. 9 E.
T. 10 N.
(Joins sheet 30)
(Joins inset, sheet 24)
(Joins sheet 38)
680 000 FEET
4 630 000 FEET
ROME
ILLINOIS
RIVER
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
3/4
1
224E
72403
304B
37B
239
77
87B
439B
54B
54D
148B
290A
2802B
7070
3070
451
132
87B
w


N
1 MILE
1 KILOMETER
Scale 1:15 840
1 500 000 FEET
0
0.5
1
1/4
1/2
3/4
R. 5 E.
T. 10 N.
565 000 FEET
555 000 FEET
1 525 000 FEET
(Joins sheet 25)
(Joins sheet 39)
(Joins sheet 33)
KNOX COUNTY
Swab
Run
18
17
16
15
19
20
21
22
36B
43
68
567B2
567C2
36C2
19C3
386B
280D2
119D2
259C2
8D
8E


570 000 FEET
1 525 000 FEET
R. 5 E.
R. 6 E.
(Joins sheet 26)
T. 10 N.
15
14
13
18
22
23
24
19
Brimfield
Creek
Walnut
water
(Joins sheet 32)
(Joins sheet 34)
(Joins sheet 40)
585 000 FEET
150
74
1 MILE
1 KILOMETER
Scale 1:15 840


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4
(Joins sheet 27)
(Joins sheet 33)
(Joins sheet 41)
(Joins sheet 35)
R. 6 E.
T. 10 N.
605 000 FEET
590 000 FEET
525 000 FEET
JUBILEE COLLEGE
STATE PARK
Jubilee Creek
Jubilee Creek

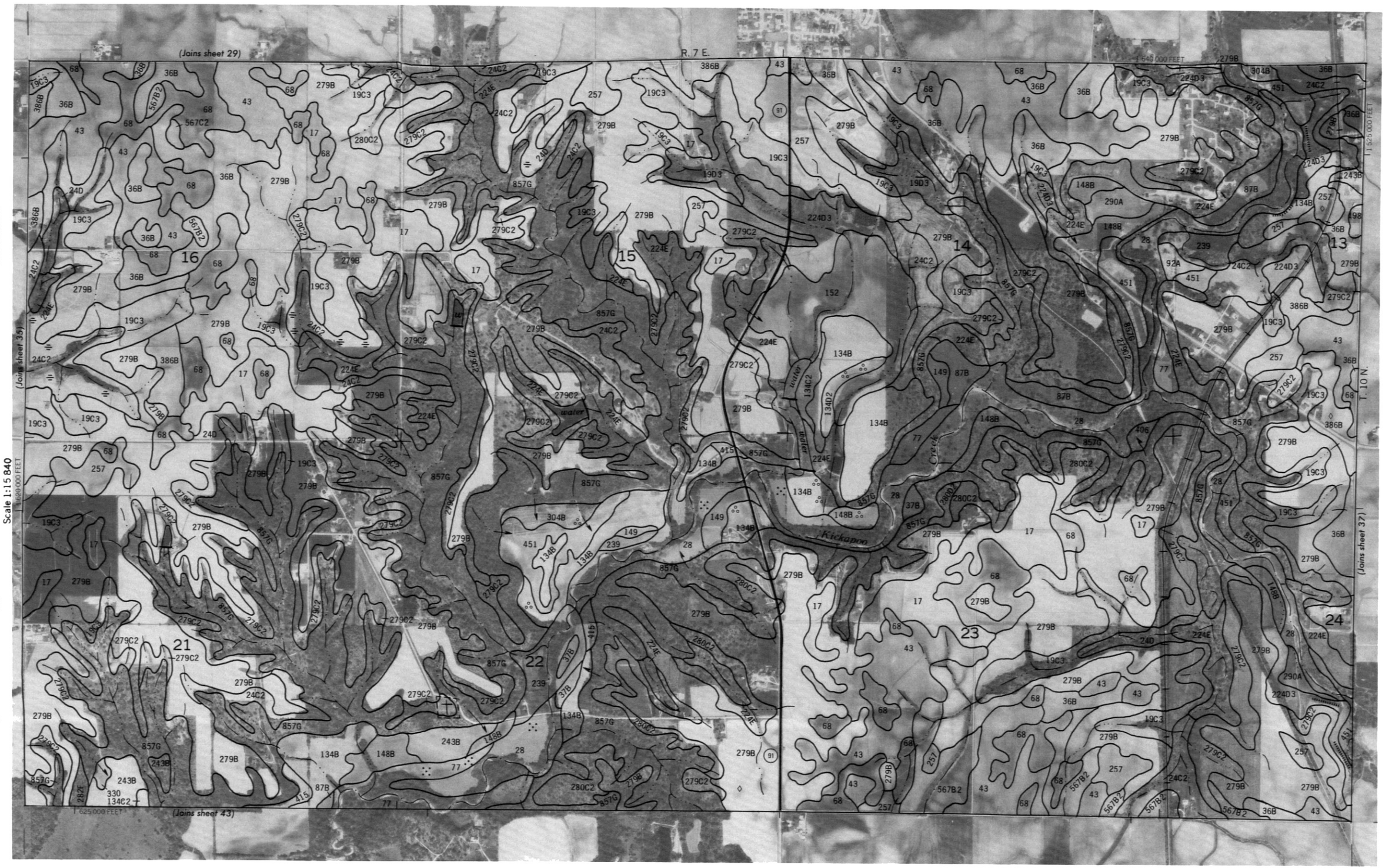


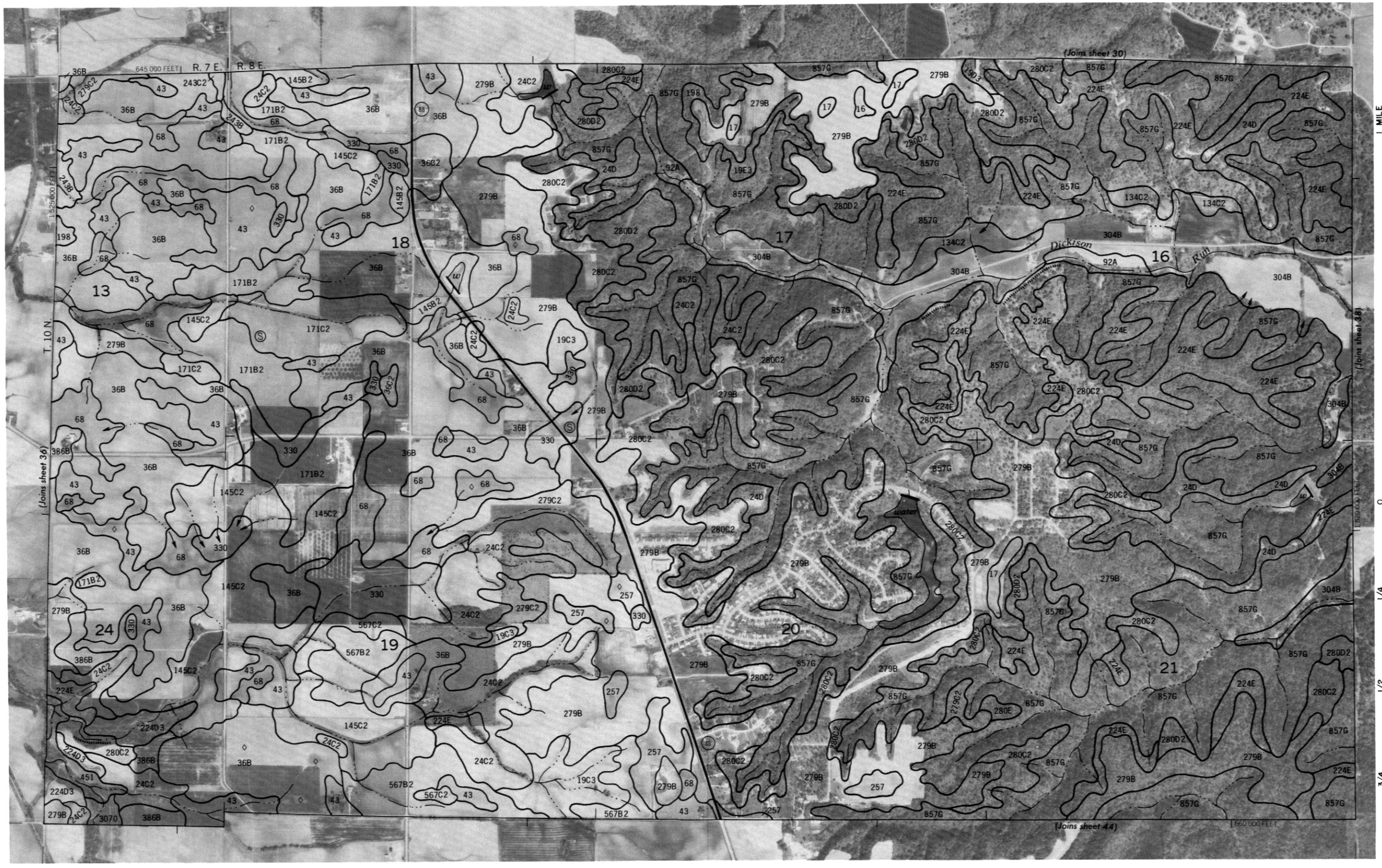
N

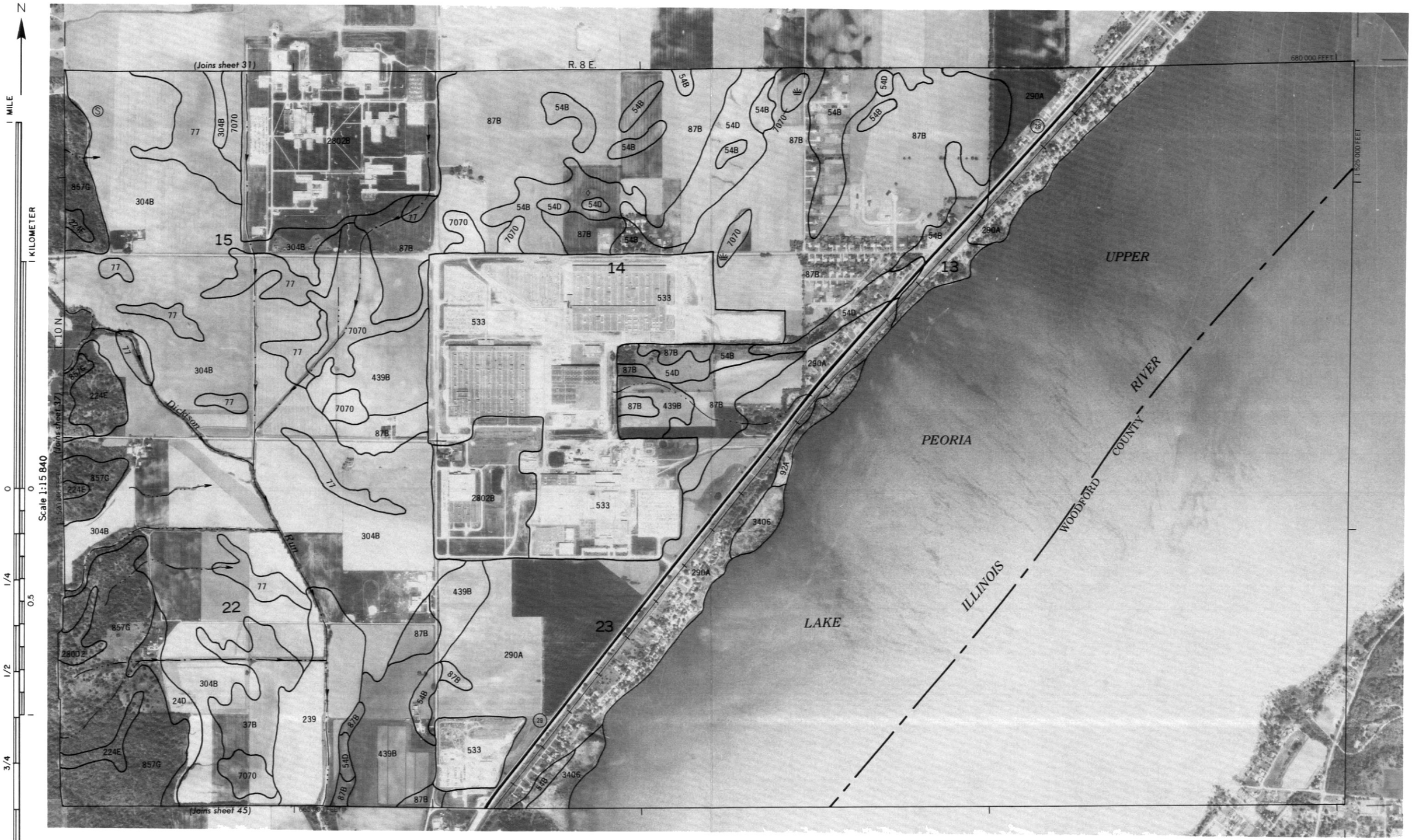
1 MILE

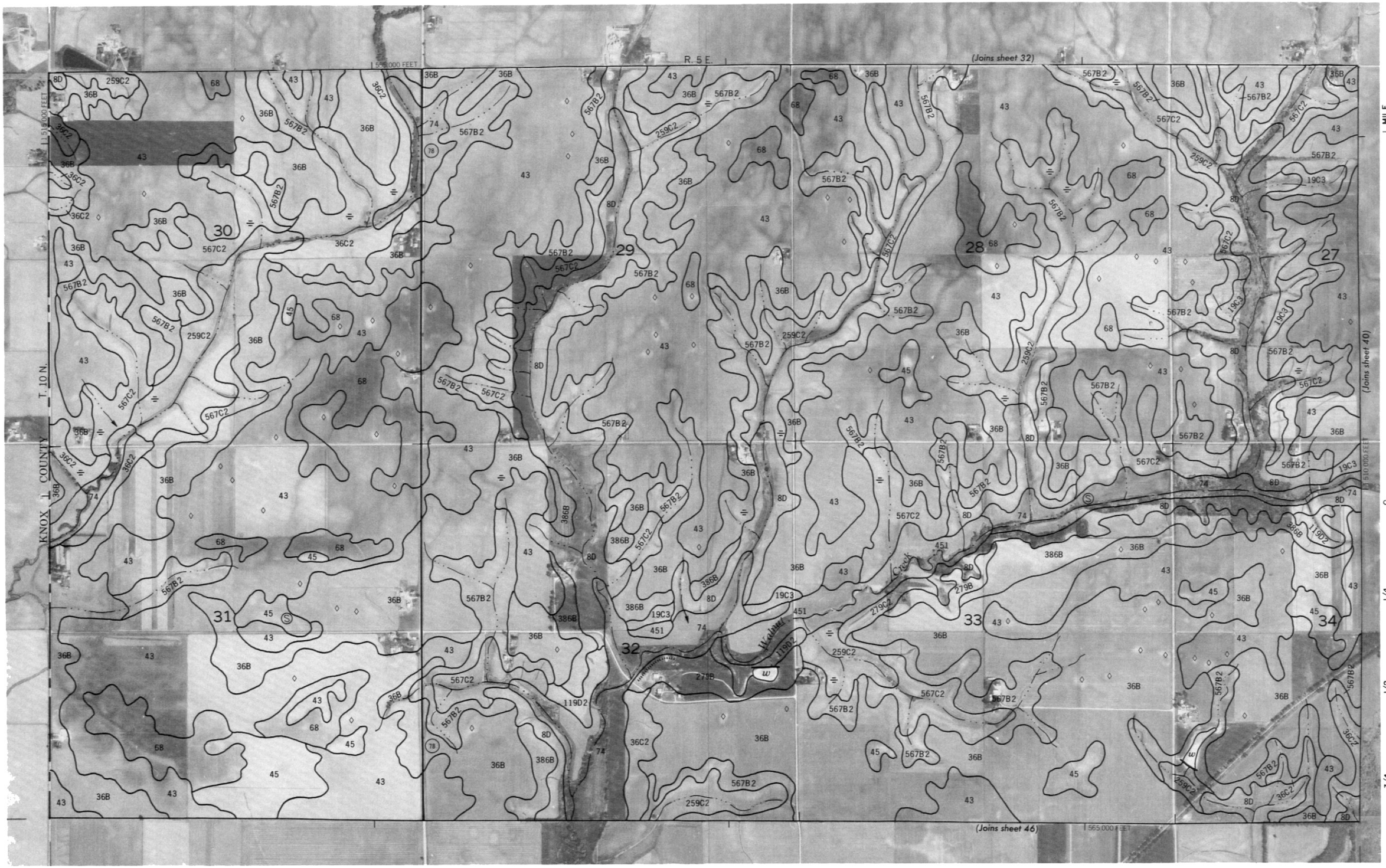
1 KILOMETER

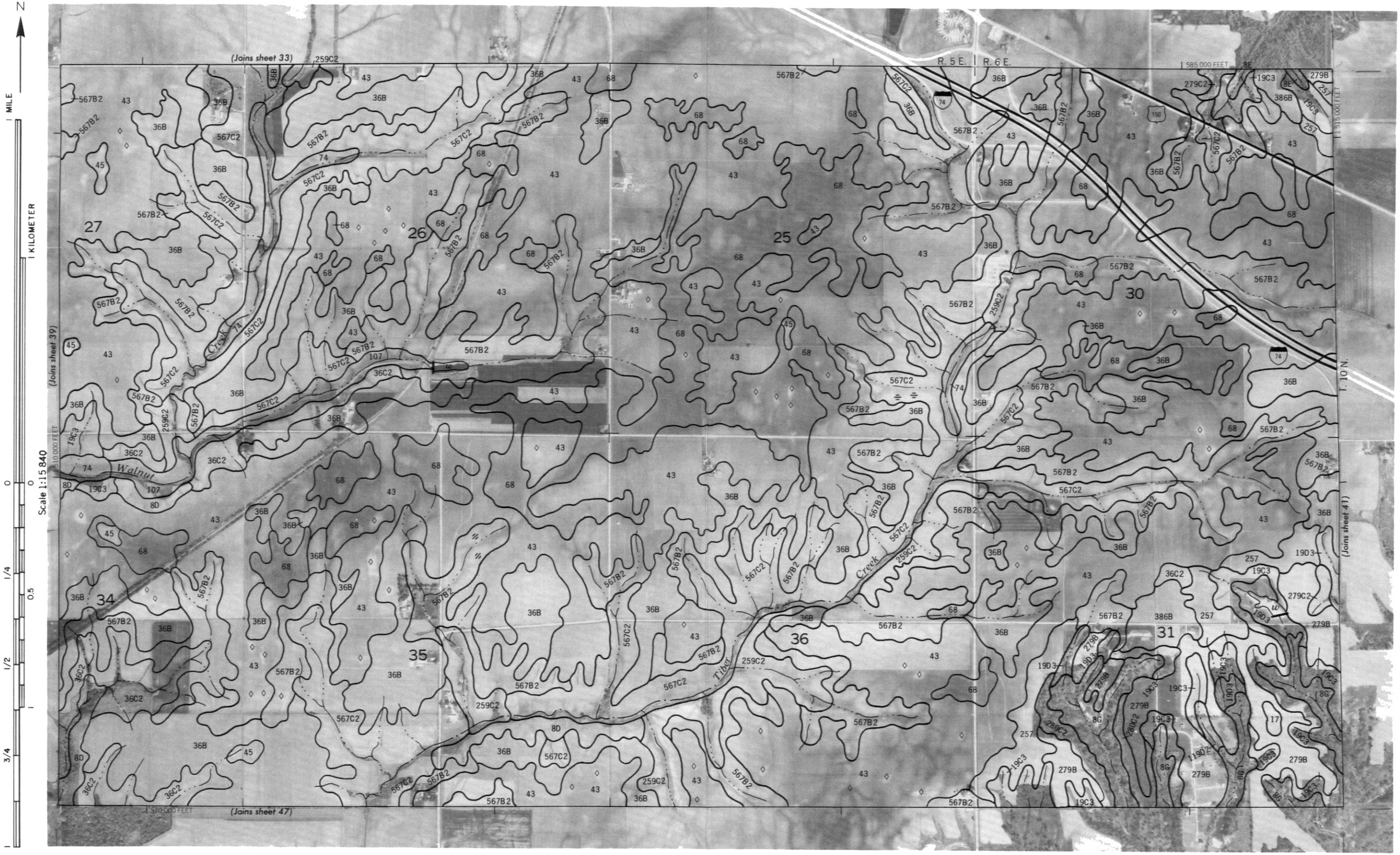
Scale 1:15 840

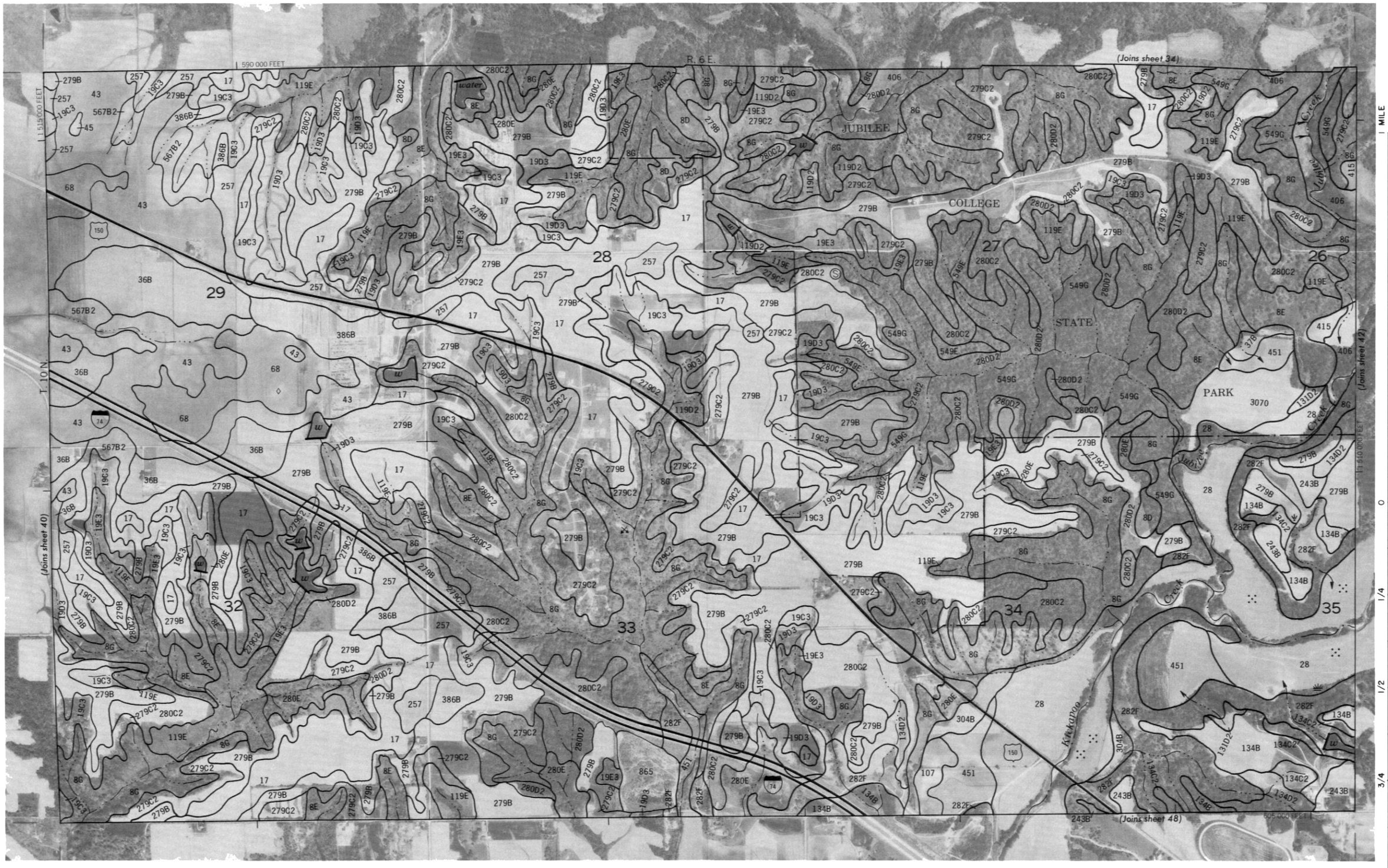

36
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4
(Joins sheet 29)
(Joins sheet 35)
(Joins sheet 43)
(Joins sheet 37)
R. 7 E.
T. 10 N.
625 000 FEET
640 000 FEET
16
15
14
13
21
22
23
24
Kickapoo Creek
water

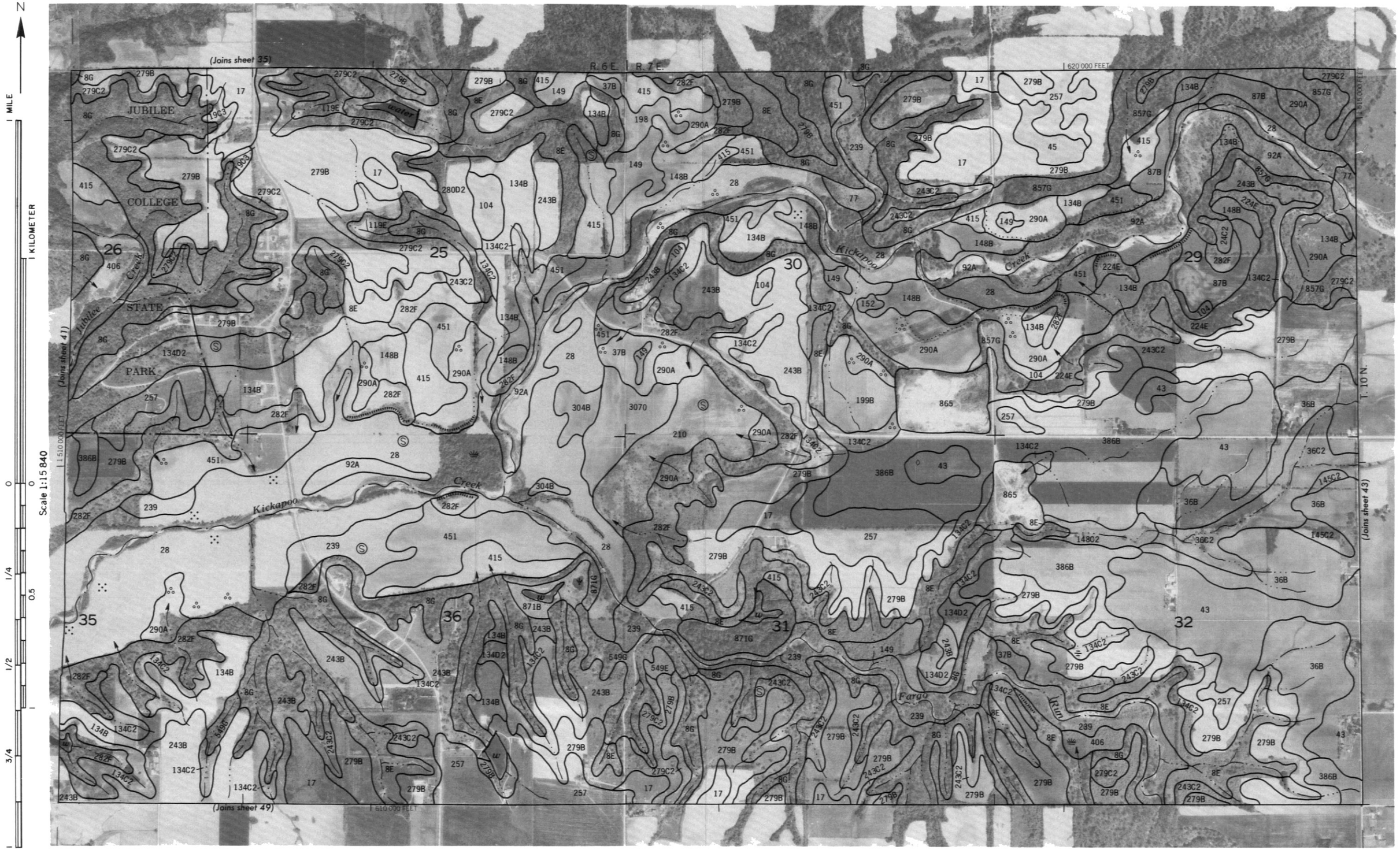

645 000 FEET
R. 7 E.
R. 8 E.
T. 10 N.
1 395 000 FEET
(Joins sheet 30)
(Joins sheet 36)
(Joins sheet 38)
(Joins sheet 44)
660 000 FEET
13
18
17
16
19
20
21
24
Dickison Run
water
N
1 MILE
1 KILOMETER
Scale 1:15 840

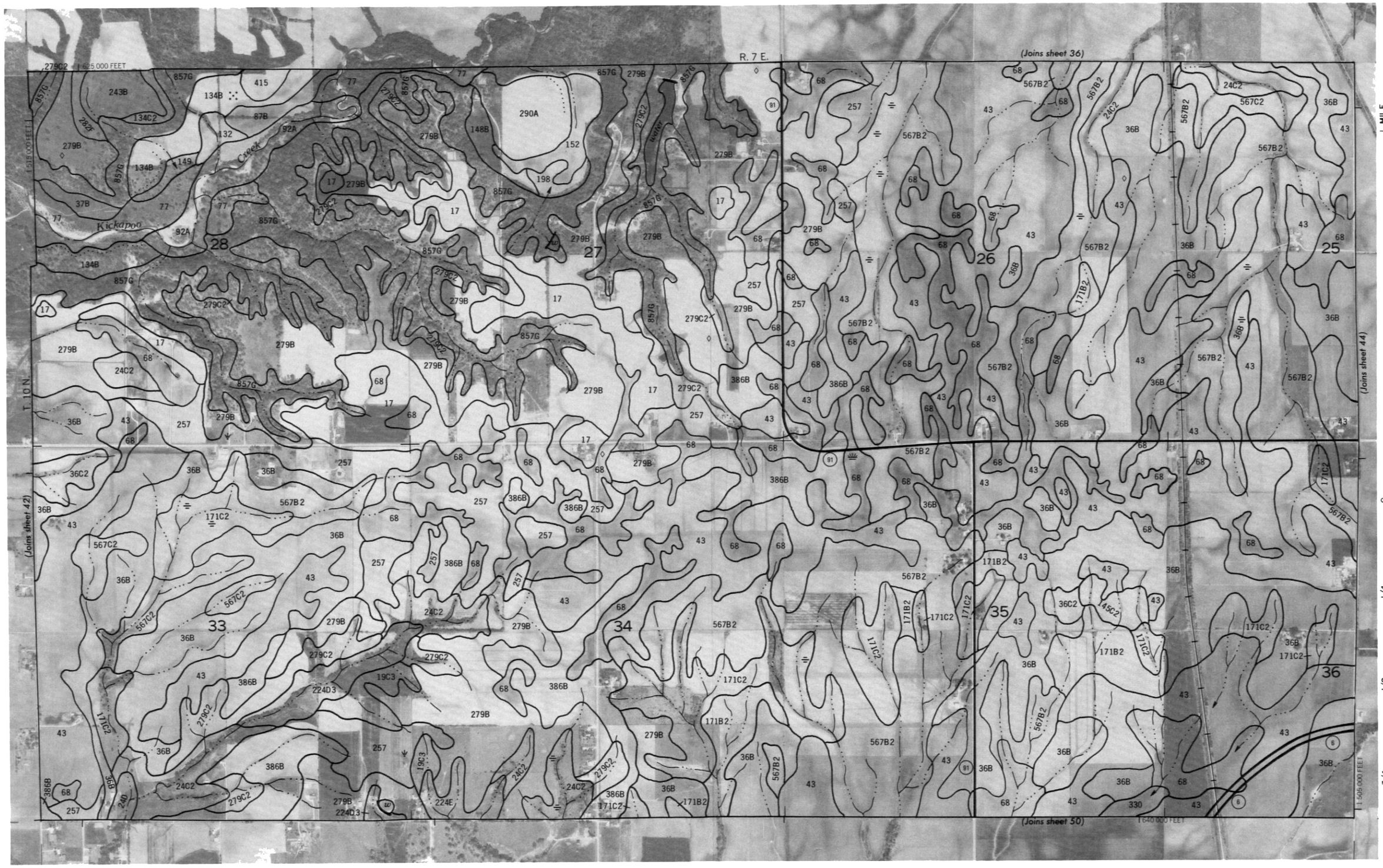

N
MILE
KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4
(Joins sheet 31)
R. 8 E.
680 000 FEET
1 525 000 FEET
(Joins sheet 37)
10 N
(Joins sheet 45)
15
14
13
22
23
UPPER
PEORIA
LAKE
RIVER
ILLINOIS
WOODFORD
COUNTY
Dickison
Run
77
304B
7070
2802B
857G
224E
87B
54B
54D
533
439B
290A
924
3406
240
37B
239

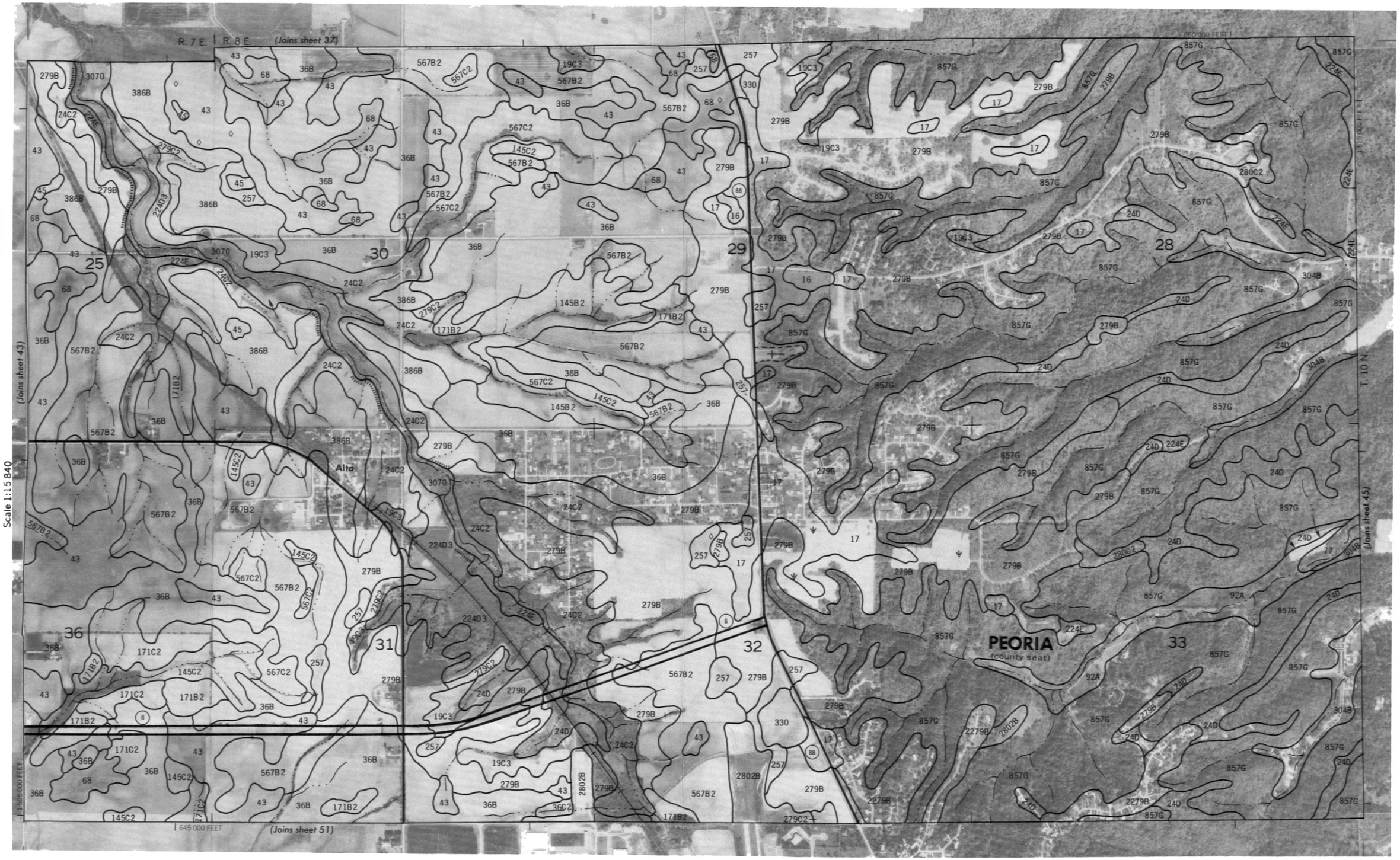

R. 5 E.
(Joins sheet 32)
555,000 FEET
510,000 FEET
T. 10 N.
KNOX COUNTY
30
29
28
27
31
32
33
34
Creek
(Joins sheet 40)
(Joins sheet 46)
565,000 FEET
N
1 MILE
1 KILOMETER
Scale 1:15 840

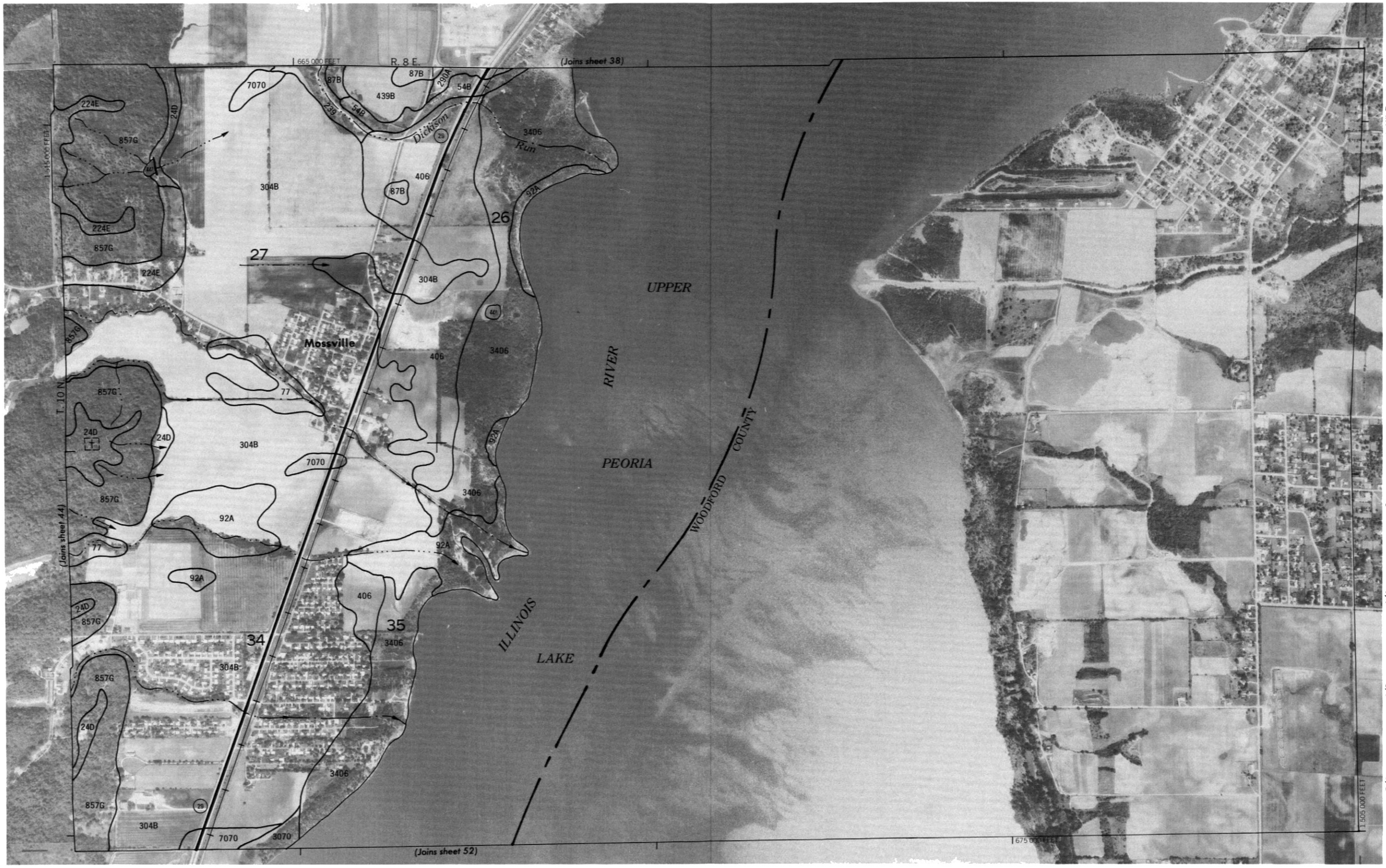

N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4
1
(Joins sheet 33)
(Joins sheet 39)
(Joins sheet 41)
(Joins sheet 47)
R. 5 E.
R. 6 E.
T. 10 N.
585 000 FEET
1 515 000 FEET
570 000 FEET
Creek
Walnut
Tiber
27
26
25
30
34
35
36
31
567B2
567C2
259C2
36B
36C2
43
68
74
107
279C2
279B
19C3
19D3
386B
257
8D
8G
8E

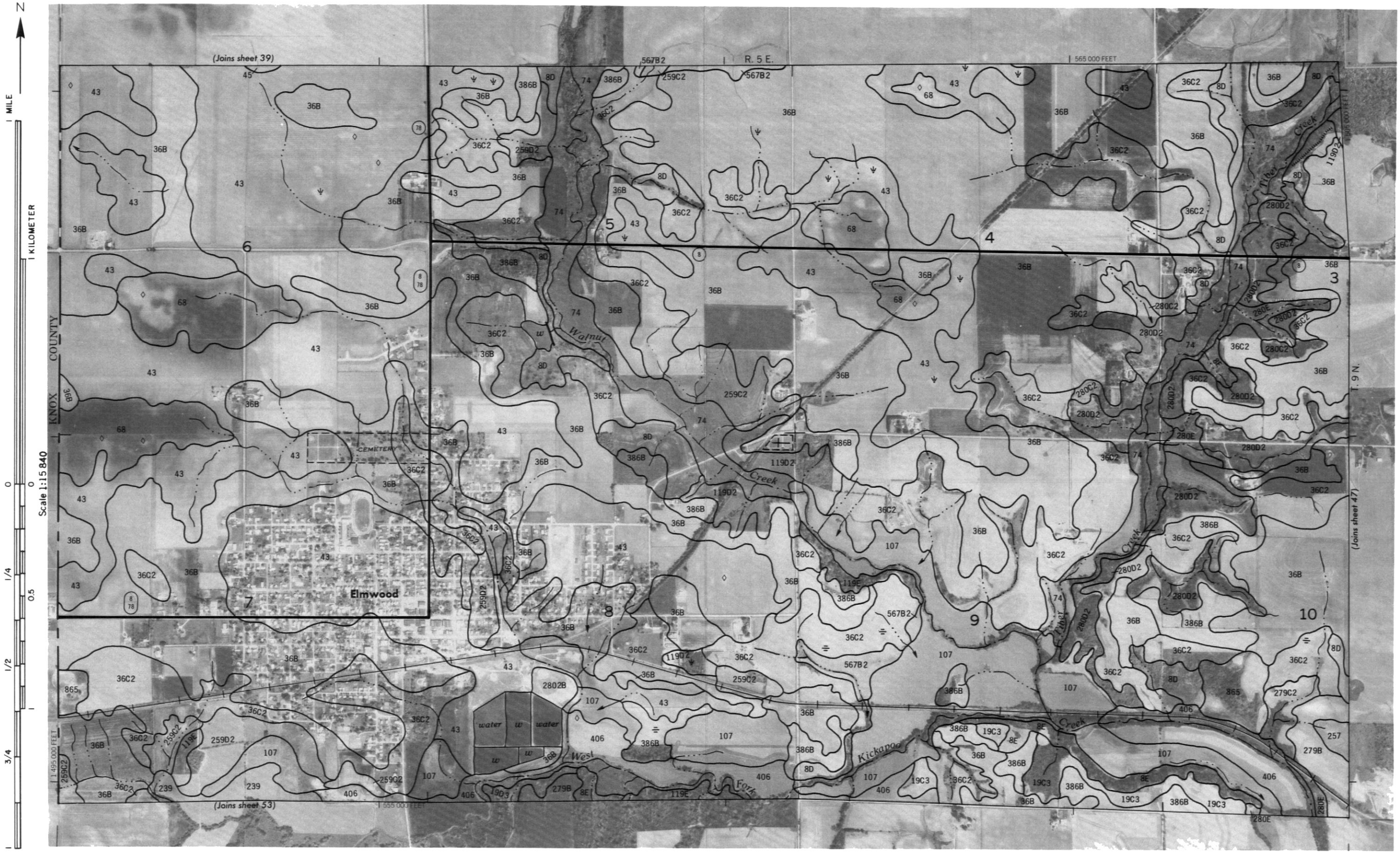

41
N
590 000 FEET
1 515 000 FEET
R. 6 E.
(Joins sheet 34)
JUBILEE
COLLEGE
STATE
PARK
Kickapoo Creek
Jubilee Creek
T. 10 N.
(Joins sheet 40)
(Joins sheet 42)
(Joins sheet 48)
1 MILE
1 KILOMETER
Scale 1:15 840

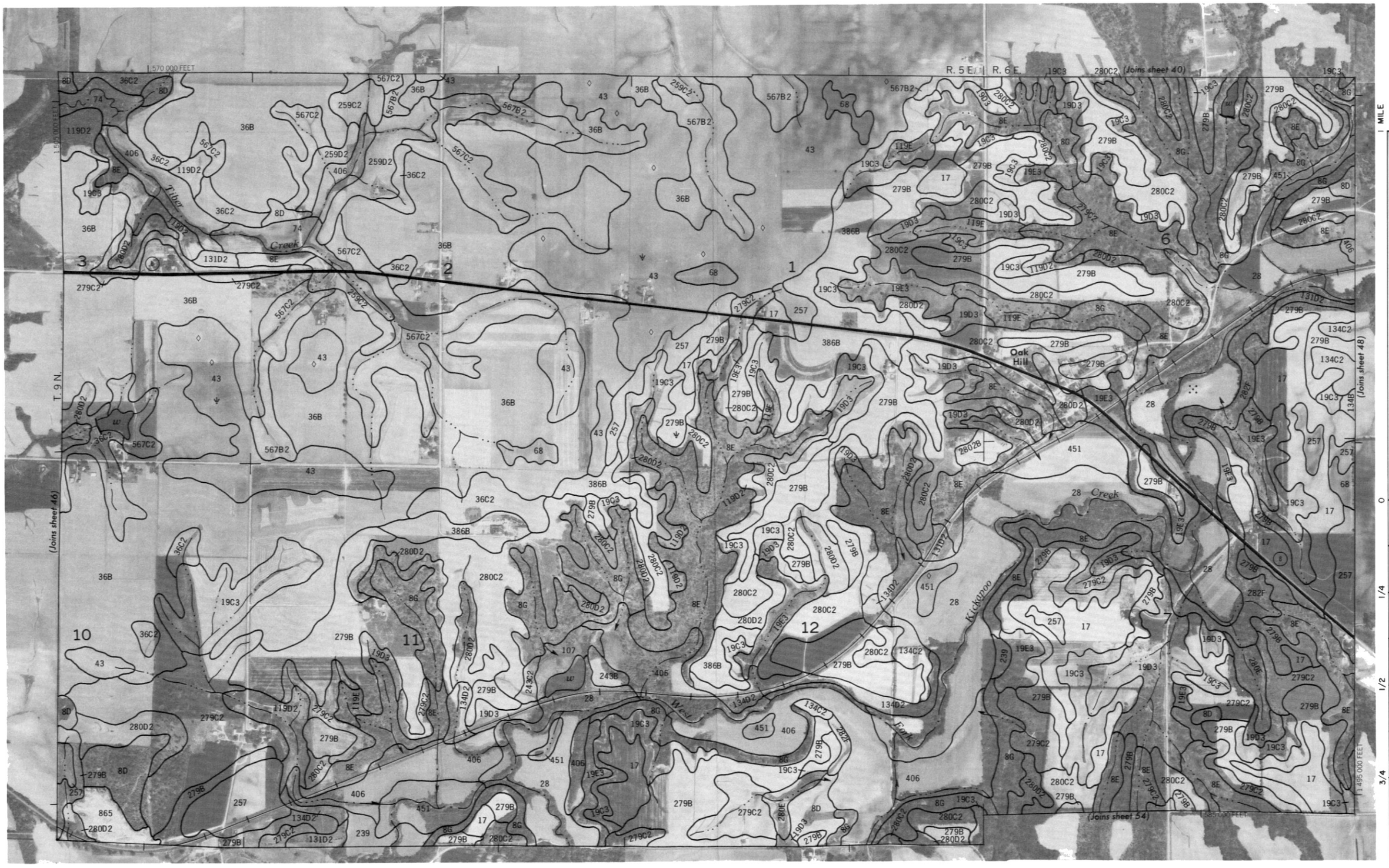

N
1 MILE
1 KILOMETER
Scale 1:15 840
(Joins sheet 35)
(Joins sheet 41)
(Joins sheet 49)
(Joins sheet 43)
R. 6 E.
R. 7 E.
T. 10 N.
620 000 FEET
615 000 FEET
610 000 FEET
510 000 FEET
JUBILEE
COLLEGE
STATE
PARK
Jubilee Creek
Kickapoo Creek
Fargo Drum
water
25
26
29
30
31
32
35
36


R. 7 E.
T 10 N.
(Joins sheet 36)
(Joins sheet 44)
(Joins sheet 42)
(Joins sheet 50)
1 625 000 FEET
1 519 000 FEET
1 505 000 FEET
1 640 000 FEET
Kickapoo Creek
Tucker
27
28
26
25
33
34
35
36
N
1 MILE
1 KILOMETER
Scale 1:15 840


R. 7 E.
R. 8 E.
(Joins sheet 37)
(Joins sheet 43)
(Joins sheet 51)
(Joins sheet 45)
T. 10 N.
25
30
29
28
36
31
32
33
Alta
PEORIA
(county seat)
645 000 FEET
650 000 FEET
1 505 000 FEET
Scale 1:15 840
N
1 MILE
1 KILOMETER
0
0.5
1/4
1/2
3/4
1


665 000 FEET
R. 8 E.
(Joins sheet 38)
1 345 000 FEET
T. 10 N.
(Joins sheet 44)
(Joins sheet 52)
675 000 FEET
1 505 000 FEET
Mossville
Dickison Run
UPPER
PEORIA
LAKE
ILLINOIS
RIVER
WOODFORD COUNTY
26
27
34
35
7070
87B
439B
54B
230A
239
3406
406
304B
224E
857G
24D
92A
77
3070
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
1
(Joins sheet 39)
R. 5 E.
565 000 FEET
T. 9 N.
KNOX COUNTY
CEMETERY
Elmwood
Walnut Creek
Kickapoo Creek
West Fork
Tiber Creek
water
(Joins sheet 53)
555 000 FEET
1 495 000 FEET
(Joins sheet 47)



N

1 MILE

1 KILOMETER

Scale 1:15 840

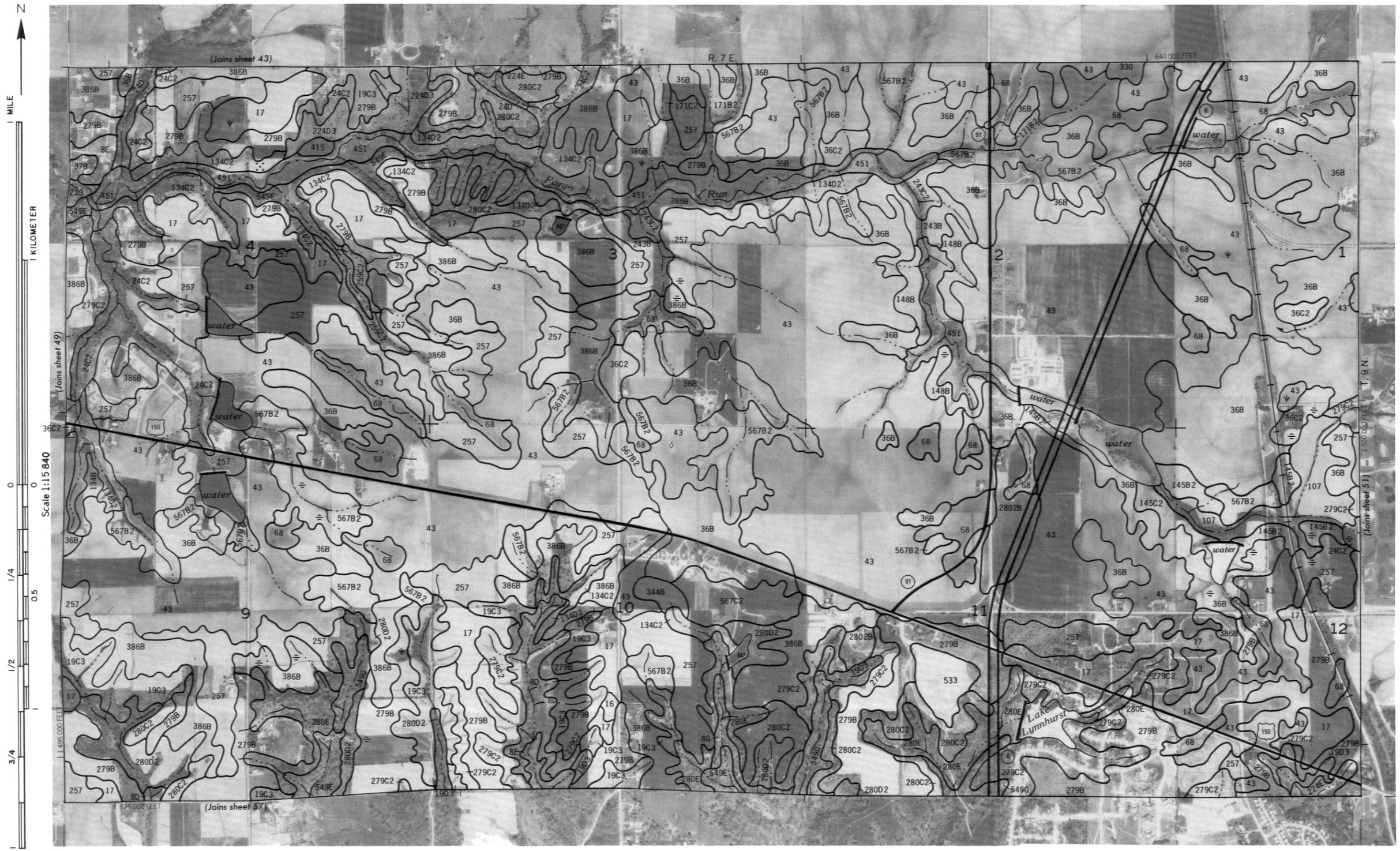
0 1/4 1/2 3/4 1

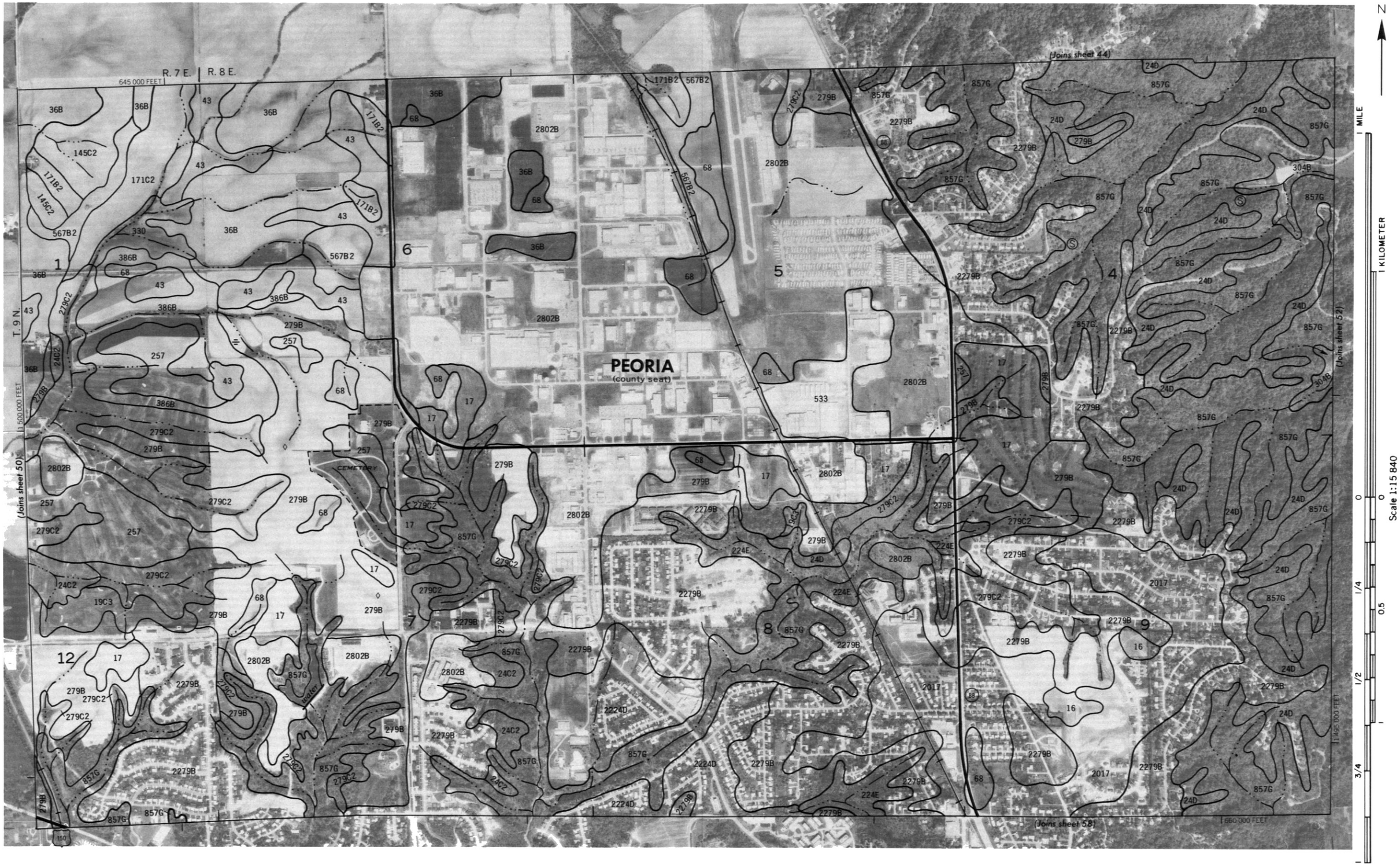
0 0.5


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
(Joins sheet 41)
(Joins sheet 47)
(Joins sheet 49)
(Joins sheet 55)
R. 6 E.
T. 9 N.
1 605 000 FEET
1 590 000 FEET
West Fork Kickapoo Creek
Kickapoo Creek
Kickapoo Creek
1 2 3 4 5 8 9 10 11


R. 6 E.
R. 7 E.
T. 9 N.
610 000 FEET
1 500 000 FEET
620 000 FEET
1 495 000 FEET
(Joins sheet 42)
(Joins sheet 50)
(Joins sheet 48)
(Joins sheet 56)
Kickapoo
CEMETERY
Farm Creek
Scale 1:15 840
1 MILE
1 KILOMETER
0
1/4
0.5
1/2
3/4
1
N
49

50


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4
1 495 000 FEET
1 640 000 FEET
1 500 000 FEET
1 625 000 FEET
R. 7 E.
T. 9 N.
(Joins sheet 43)
(Joins sheet 49)
(Joins sheet 57)
(Joins sheet 51)
Fargo Run
Lake Lymnhurst
water
4
3
2
1
9
10
11
12


R. 7 E.
R. 8 E.
T. 9 N.
645 000 FEET
500 000 FEET
660 000 FEET
(Joins sheet 44)
(Joins sheet 50)
(Joins sheet 52)
(Joins sheet 58)
PEORIA
(county seat)
CEMETERY
1
4
5
6
7
8
9
12
16
17
MILE
KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
N

52

N

1 MILE

1 KILOMETER

Scale 1:15 840

0 0 1/4 0.5 1/2 1 3/4 1

(Joins sheet 45) R. 8 E.

T. 9 N.

(Joins sheet 51)

(Joins sheet 59)

1 498 000 FEET

1 665 000 FEET

UPPER SPOON RIVER

PEORIA COUNTY

LAKE

WOODFORD COUNTY

857G 304B 3070 7070 3 290A 24D 2224D 2802B 24C2 92A 10 29

(Joins sheet 94) R. 6 E.

1 595 000 FEET

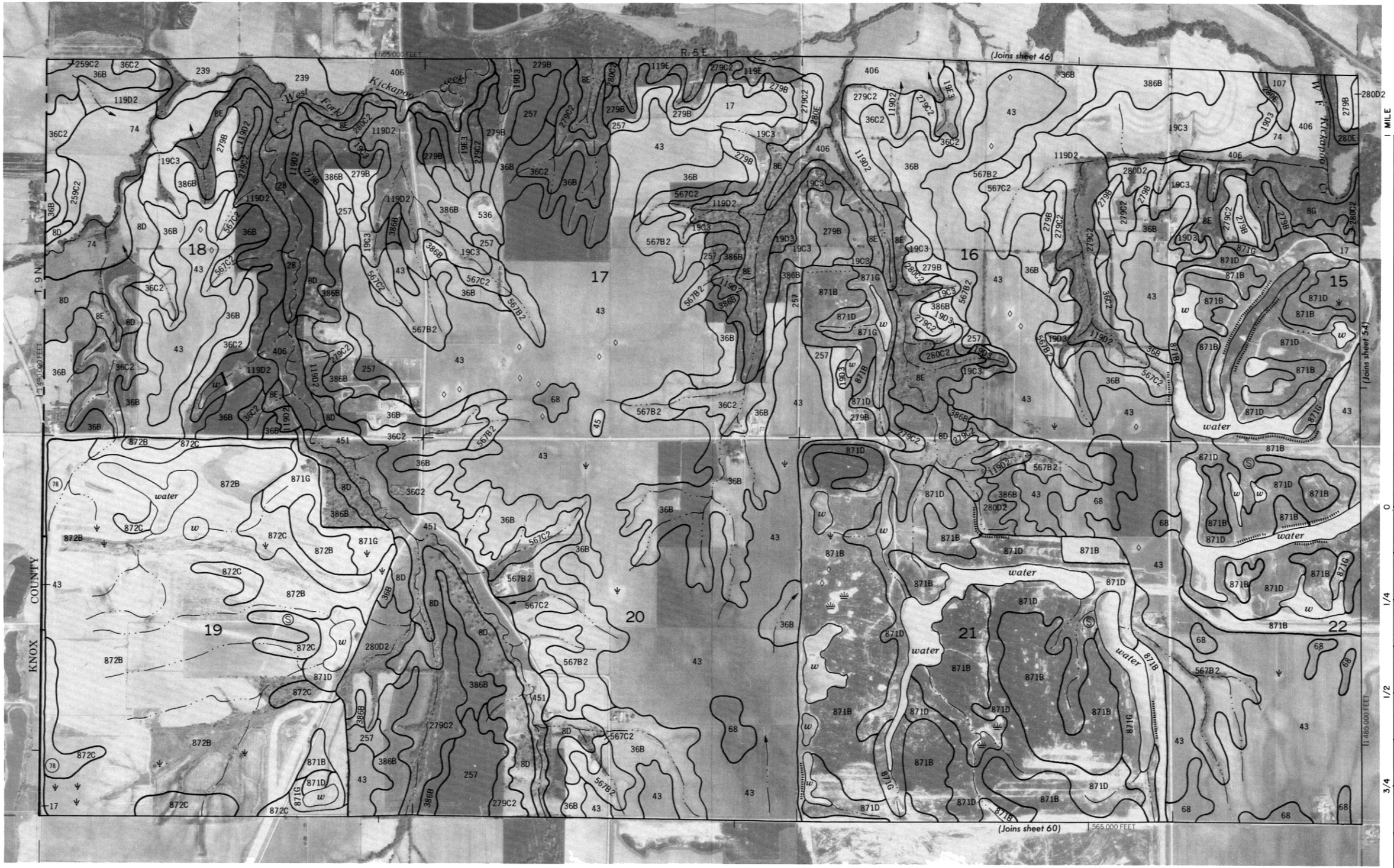
T. 6 N.

(Joins inset, sheet 93)

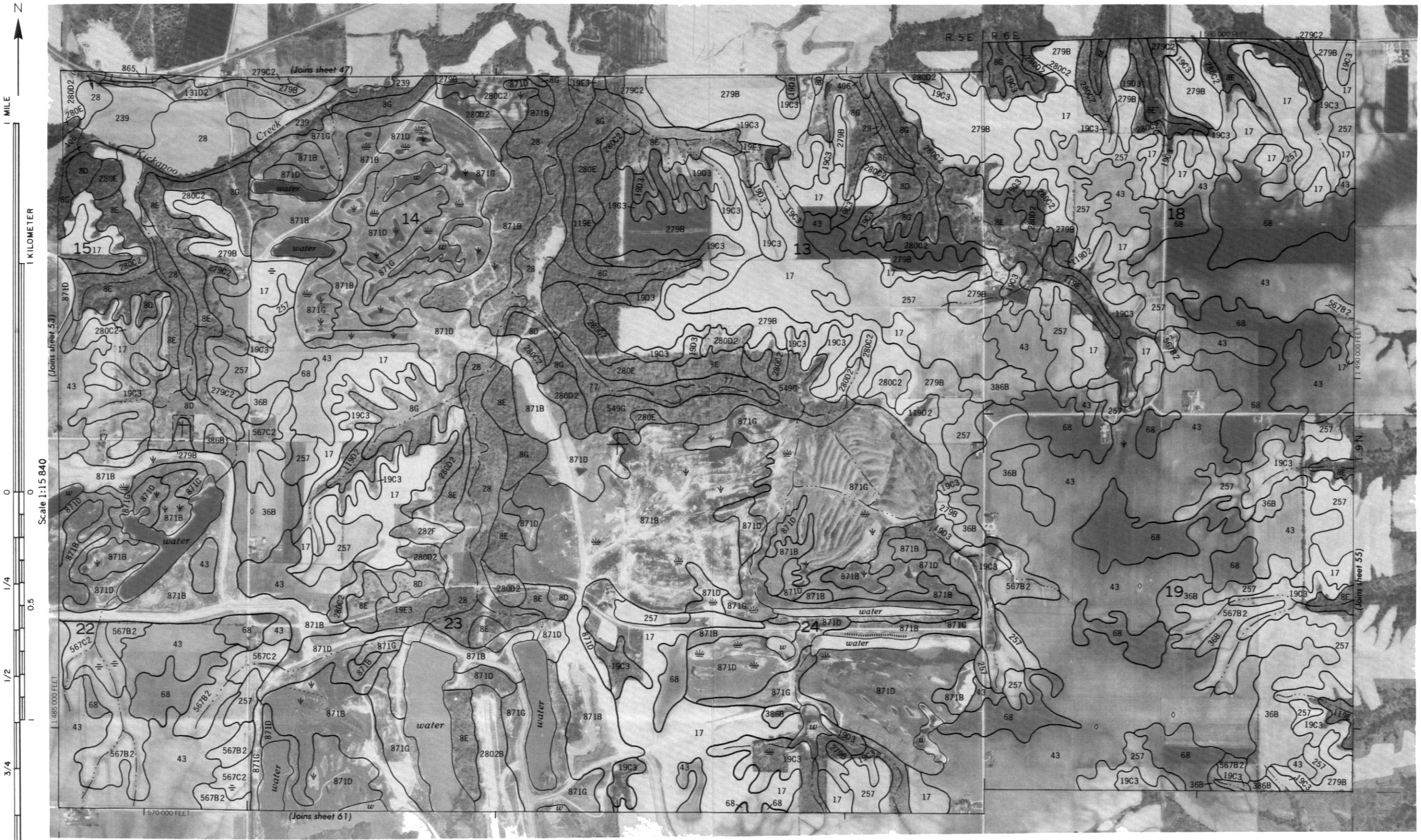
1 405 000 FEET

1 590 000 FEET

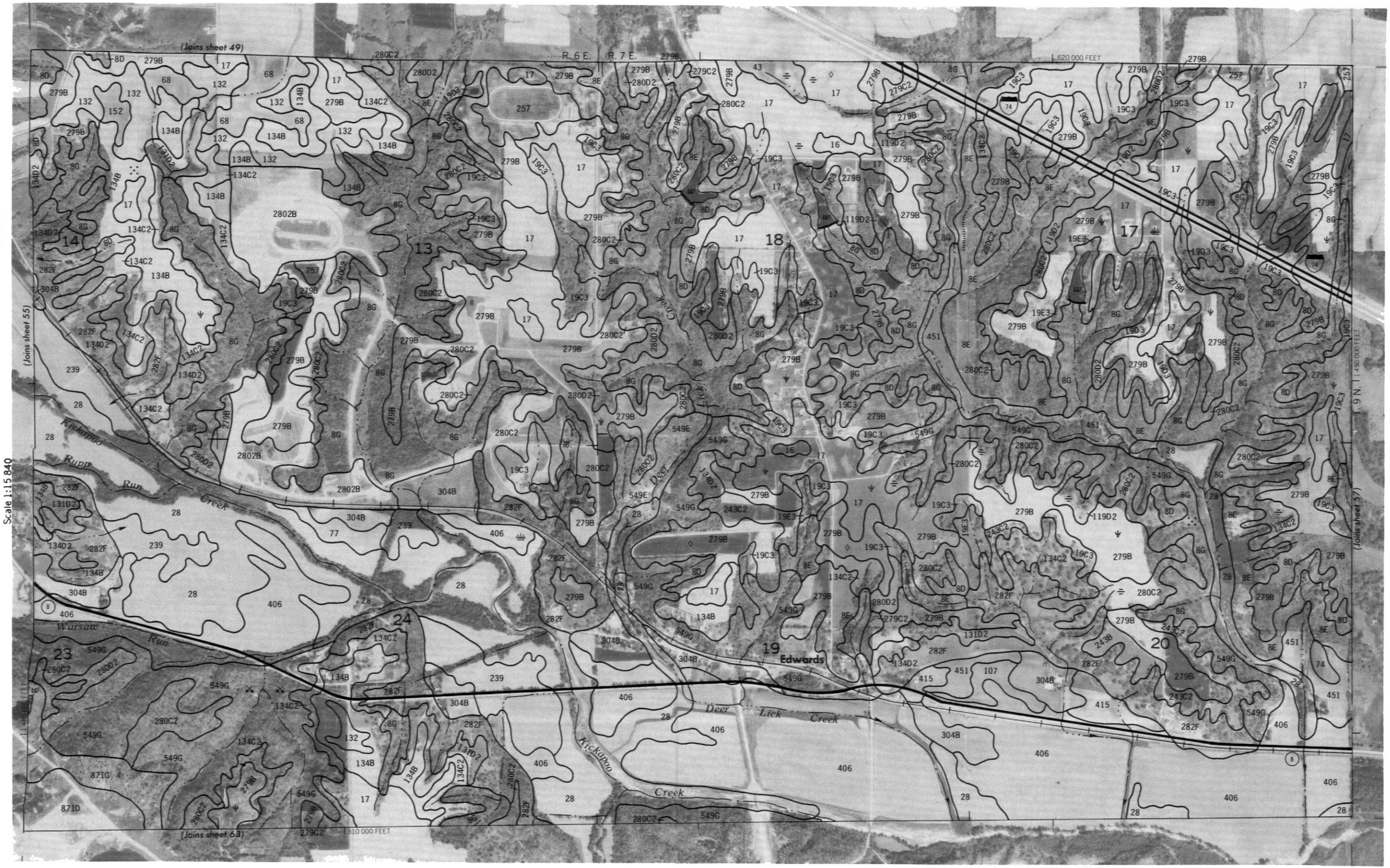
871B 871D 871G water w 4 404 3406 5 ILLINOIS RIVER PEORIA COUNTY TAZEWELL COUNTY

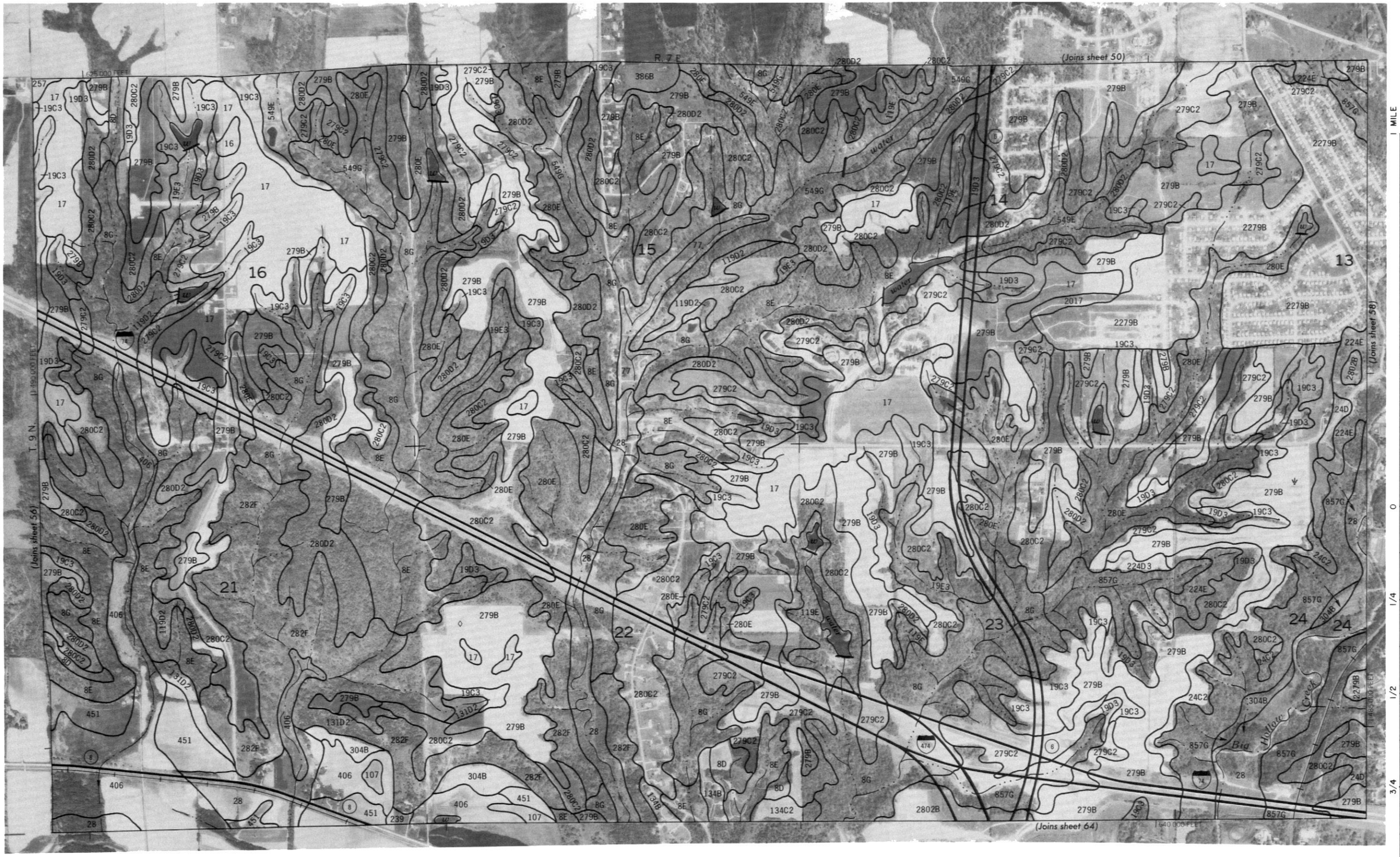

R. 5 E.
T. 9 N.
565 000 FEET
490 000 FEET
485 000 FEET
(Joins sheet 46)
(Joins sheet 54)
(Joins sheet 60)
West Fork Kickapoo Creek
W. f. Kickapoo
17
18
16
15
19
20
21
22
COUNTY
KNOX
water
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
3/4
1

54


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
1 485 000 FEET
1 490 000 FEET
570 000 FEET
545 000 FEET
R. 5 E.
R. 6 E.
T. 9 N.
Kickapoo Creek
(Joins sheet 47)
(Joins sheet 53)
(Joins sheet 61)
(Joins sheet 55)
water
13
14
15
17
18
19
22
23
24


R. 6 E.
T. 9 N.
1 590 000 FEET
1 490 000 FEET
1 605 000 FEET
(Joins sheet 48)
(Joins sheet 56)
(Joins sheet 54)
(Joins sheet 62)
Nixon
Rupp
Run
Creek
water
16
17
20
21
22
23
MILE
KILOMETER
Scale 1:15 840
0
0.5
1
1/2
1/4
3/4


(Joins sheet 49)
R. 6 E.
R. 7 E.
620 000 FEET
(Joins sheet 55)
(Joins sheet 63)
(Joins sheet 57)
1 610 000 FEET
T. 9 N.
1 490 000 FEET
Kickapoo Creek
Rupp Run
Deer Lick Creek
Warsaw Run
Edwards
13
14
17
18
19
20
23
24
Scale 1:15 840
1 MILE
1 KILOMETER
0
0.5
1/4
1/2
3/4


R. 7 E.
T. 9 N.
625 000 FEET
1 490 000 FEET
640 000 FEET
(Joins sheet 50)
(Joins sheet 56)
(Joins sheet 56)
(Joins sheet 64)
16
15
14
13
21
22
23
24
24
28
Big Hollow Creek
water
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4

58

N

1 MILE

1 KILOMETER

Scale 1:15 840

0 0.5 1/4 1/2 3/4 1

R. 7 E. | R. 8 E.

(Joins sheet 51)

(Joins sheet 57)

(Joins sheet 59)

(Joins sheet 65)

660 000 FEET

645 000 FEET

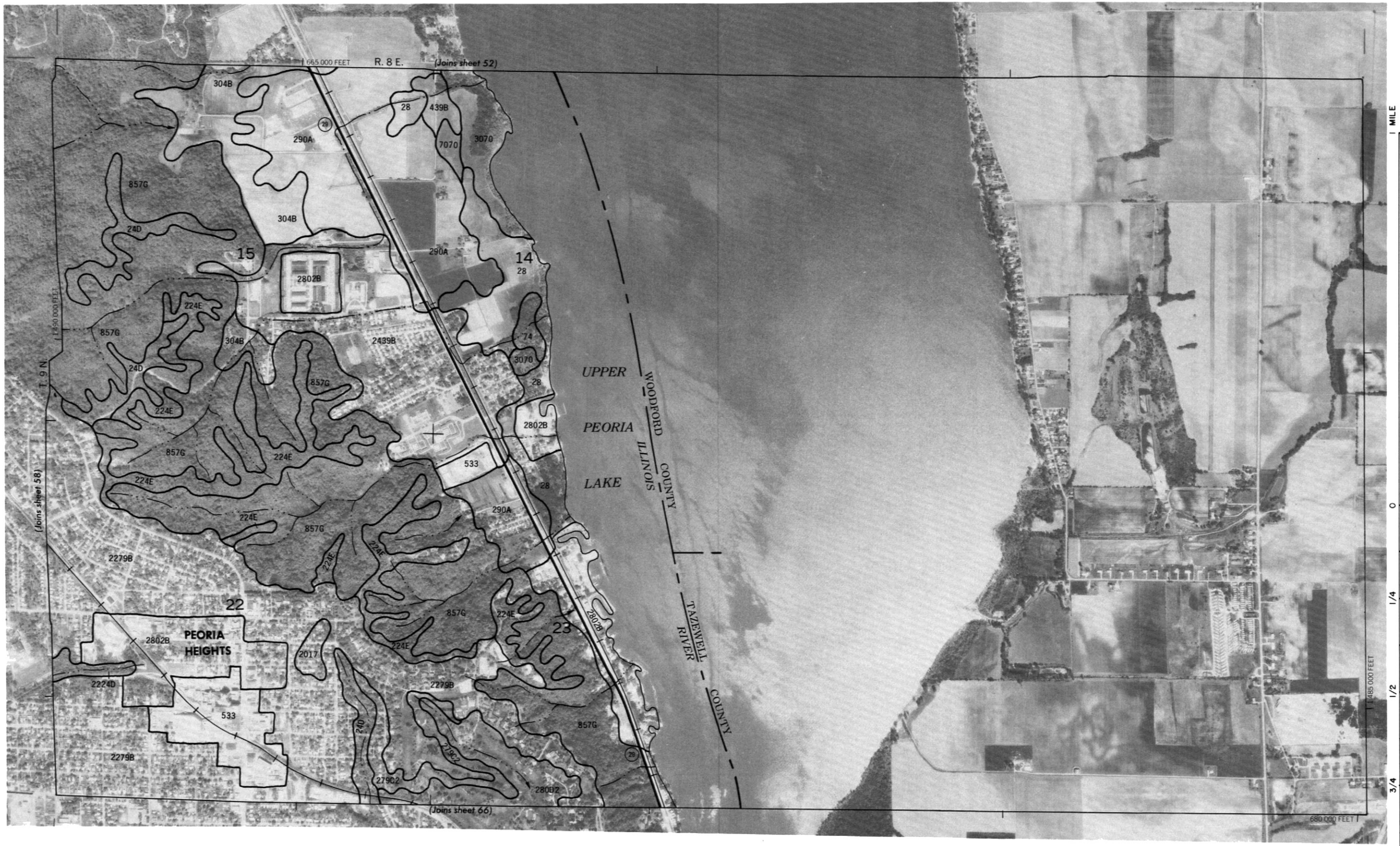
T. 9 N.

Big Hollow Creek

PEORIA
(county seat)

13 18 17 16 24 19 20 21

150 74 24 (S)


665 000 FEET
R. 8 E.
(Joins sheet 52)
304B
28
439B
29
290A
7070
3070
857G
304B
24D
15
290A
14
28
2802B
224E
857G
304B
2439B
74
3070
24D
857G
28
224E
2802B
857G
224E
533
28
224E
290A
224E
857G
224E
224E
2279B
22
857G
224E
23
2802B
PEORIA HEIGHTS
2017
224E
2279B
2224D
533
240
2279B
857G
2790Z
2790Z
2800Z
(Joins sheet 66)
T. 9 N.
(Joins sheet 58)
UPPER
PEORIA
LAKE
WOODFORD COUNTY
ILLINOIS
TAZEWELL COUNTY
RIVER
680 000 FEET
485 000 FEET
N
MILE
KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4

60

N

1 MILE

1 KILOMETER

Scale 1:15 840

0 0 1/4 0.5 1/2 3/4 1

KNOX COUNTY

T. 9 N.

R. 5 E.

565 000 FEET

1 480 000 FEET

1 475 000 FEET

1 555 000 FEET

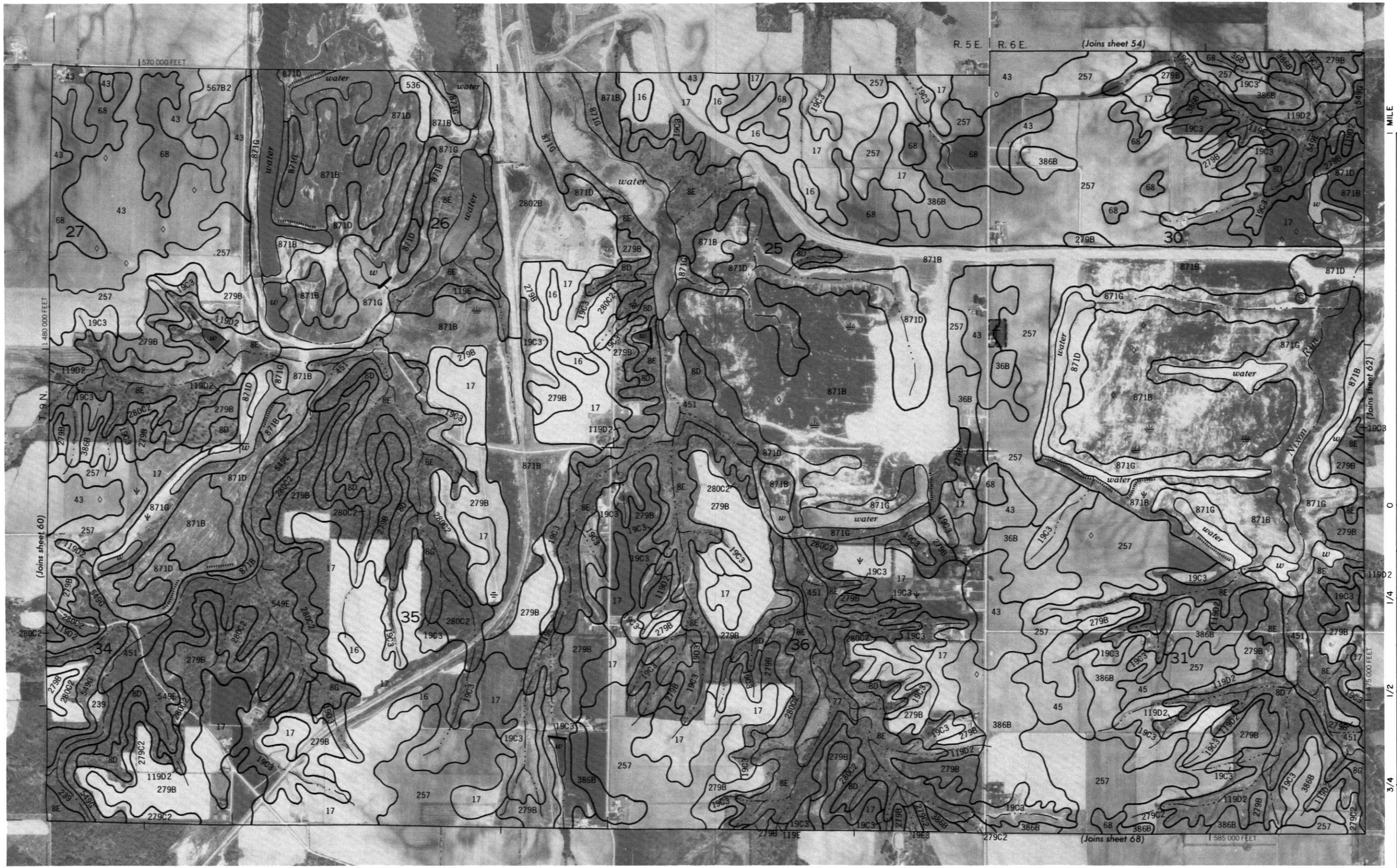
(Joins sheet 53)

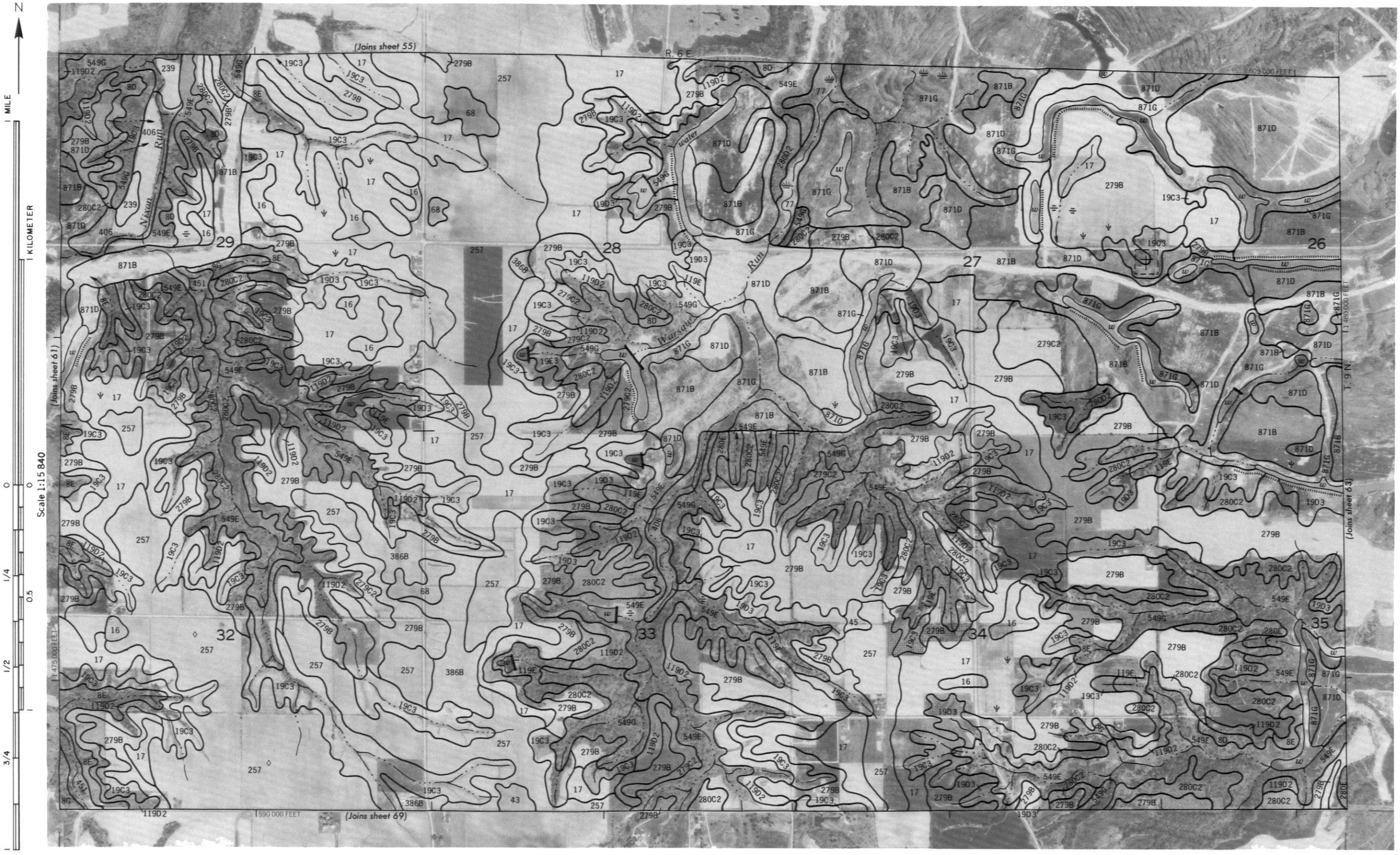
(Joins sheet 61)

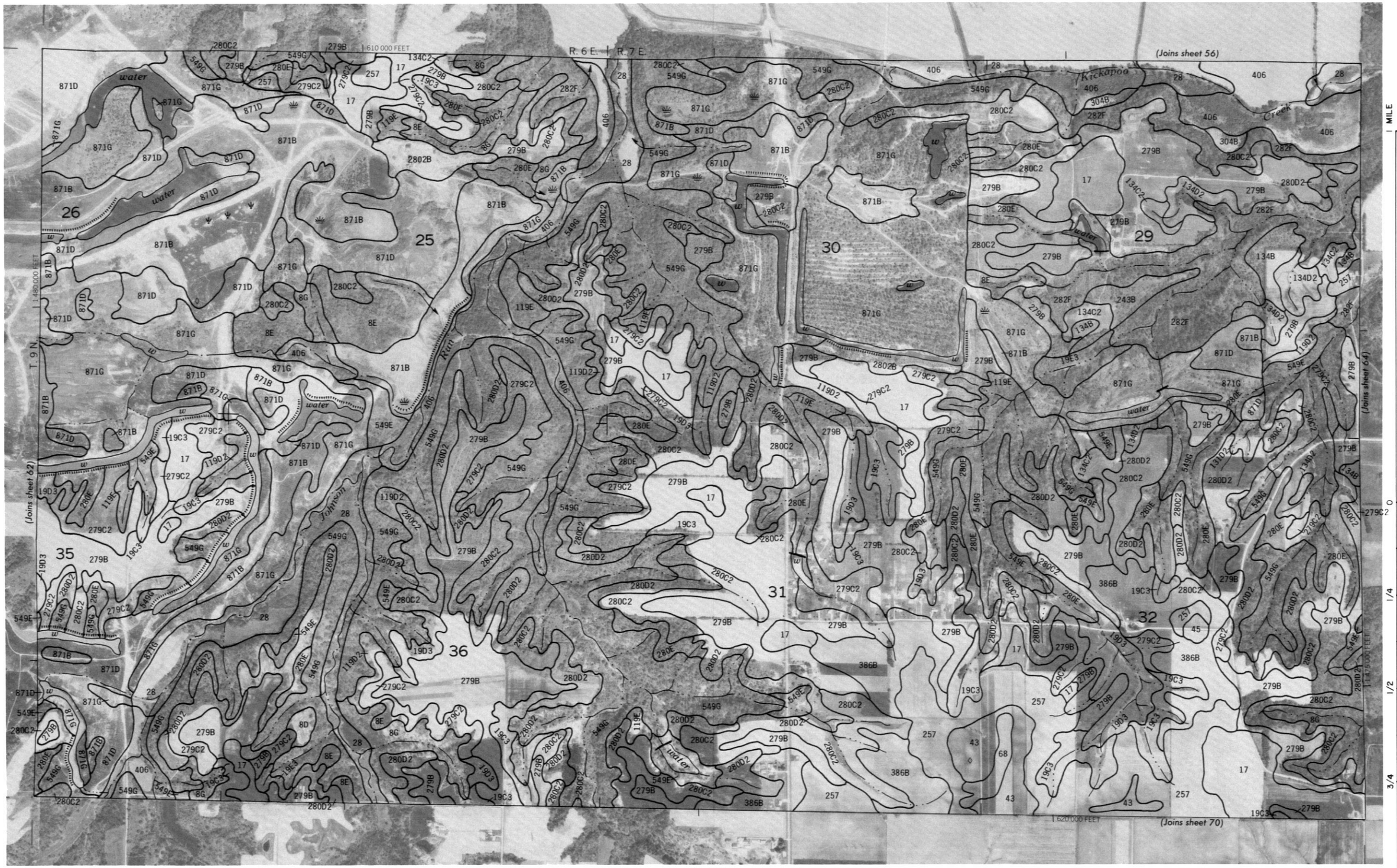
(Joins sheet 67)

17 30 29 28 27 31 32 33 34

872B 872C 871B 871D 871G 386B 279C2 279B 280D2 36C2 36B 43 68 567B2 567C2 19C3 119D2 257 water


61
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1/4
1/2
3/4
1
R. 5 E.
R. 6 E.
(Joins sheet 54)
T 9 N.
570 000 FEET
1 480 000 FEET
1 585 000 FEET
1 575 000 FEET
(Joins sheet 60)
(Joins sheet 62)
(Joins sheet 68)
25
26
27
30
31
34
35
36
water
Kickapoo Creek

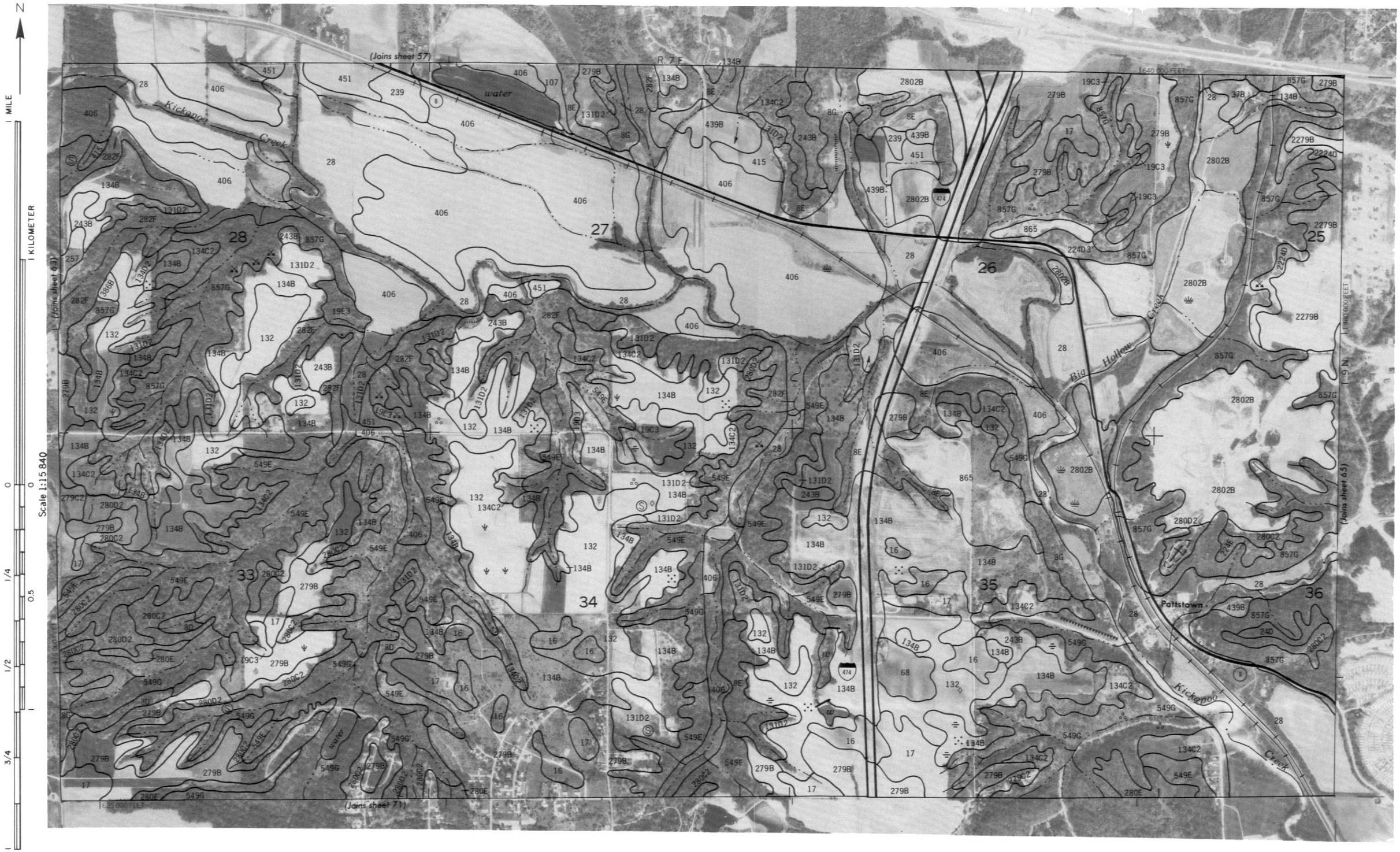

N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
(Joins sheet 55)
(Joins sheet 61)
(Joins sheet 69)
(Joins sheet 63)
R. 6 E.
T. 9 N.
1 605 000 FEET
1 590 000 FEET
1 480 000 FEET
1 475 000 FEET
Nixon Run
Warsaw Run
water
29
28
27
26
32
33
34
35



N

1 MILE
1 KILOMETER

Scale 1:15 840


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4
(Joins sheet 57)
(Joins sheet 63)
(Joins sheet 71)
(Joins sheet 65)
R. 7 E.
T. 9 N.
1640 000 FEET
1 480 000 FEET
1 320 000 FEET
1 315 000 FEET
1 625 000 FEET
Kickapoo Creek
Big Hollow Creek
water
Pattstown
27
28
33
34
26
25
35
36
474


R.7E. | R.8E.
695 000 FEET
T. 9N.
1 480 000 FEET
25
30
29
28
36
31
32
33
PEORIA
(county seat)
(Joins sheet 58)
(Joins sheet 64)
(Joins sheet 66)
(Joins sheet 72)
857G
2224D
2017
2279B
2802B
533
279B
280C2
19D3
224E
224D3
279C2
Run
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
3/4

66

N

1 MILE

1 KILOMETER

Scale 1:15 840

(Joins sheet 59)

R. 8 E.

680 000 FEET

1 460 000 FEET

(Joins sheet 67)

(Joins sheet 73)

665 000 FEET

T. 9 N.

UPPER PEORIA LAKE

RIVER

TAZEWELL COUNTY

ILLINOIS

PEORIA

LAKE

PEORIA
(county seat)

27

26

34

35

2279B

857G

280D2

2224D

280C2

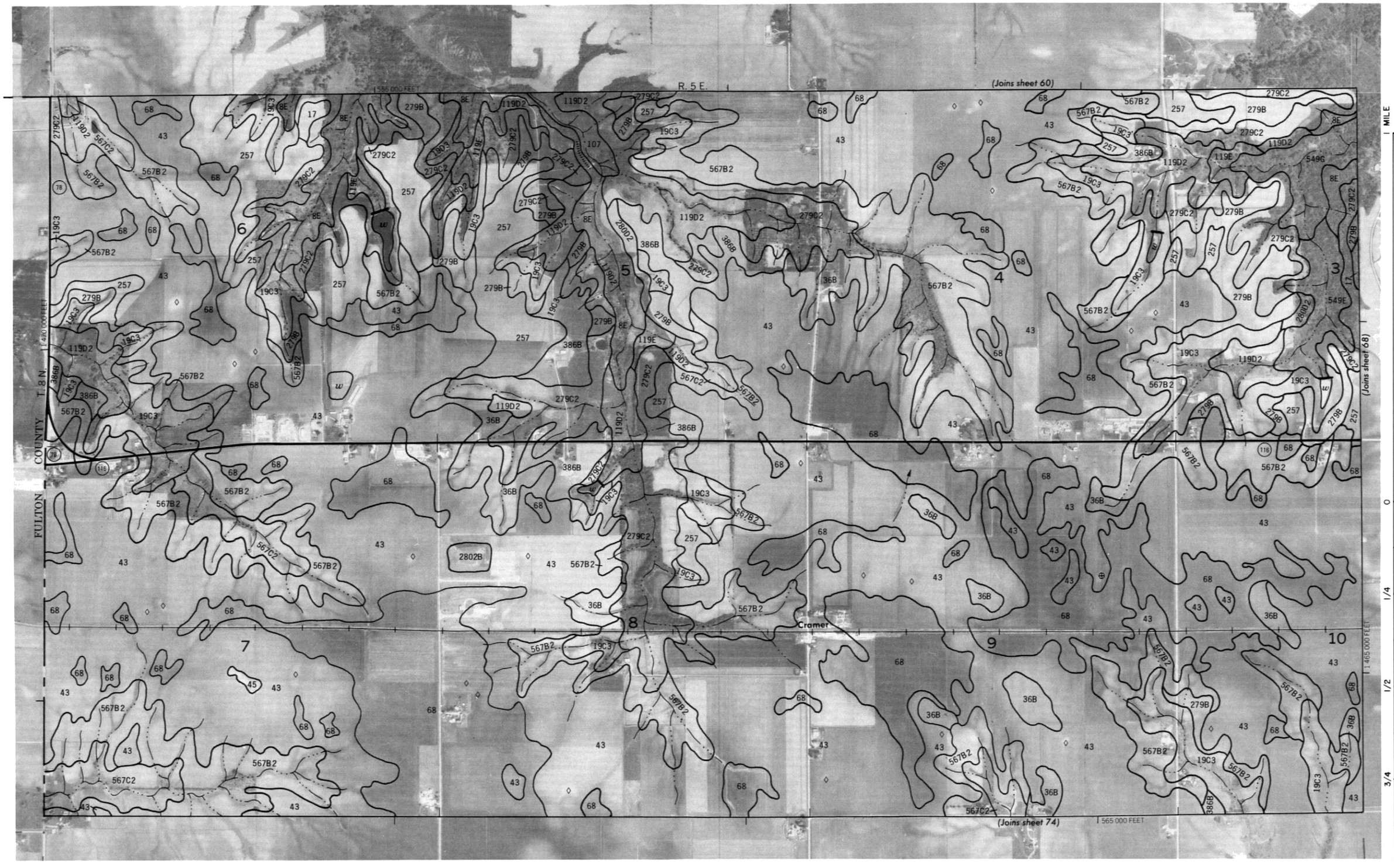
2802B

2017

2290A

533

CEMETERY



67

N

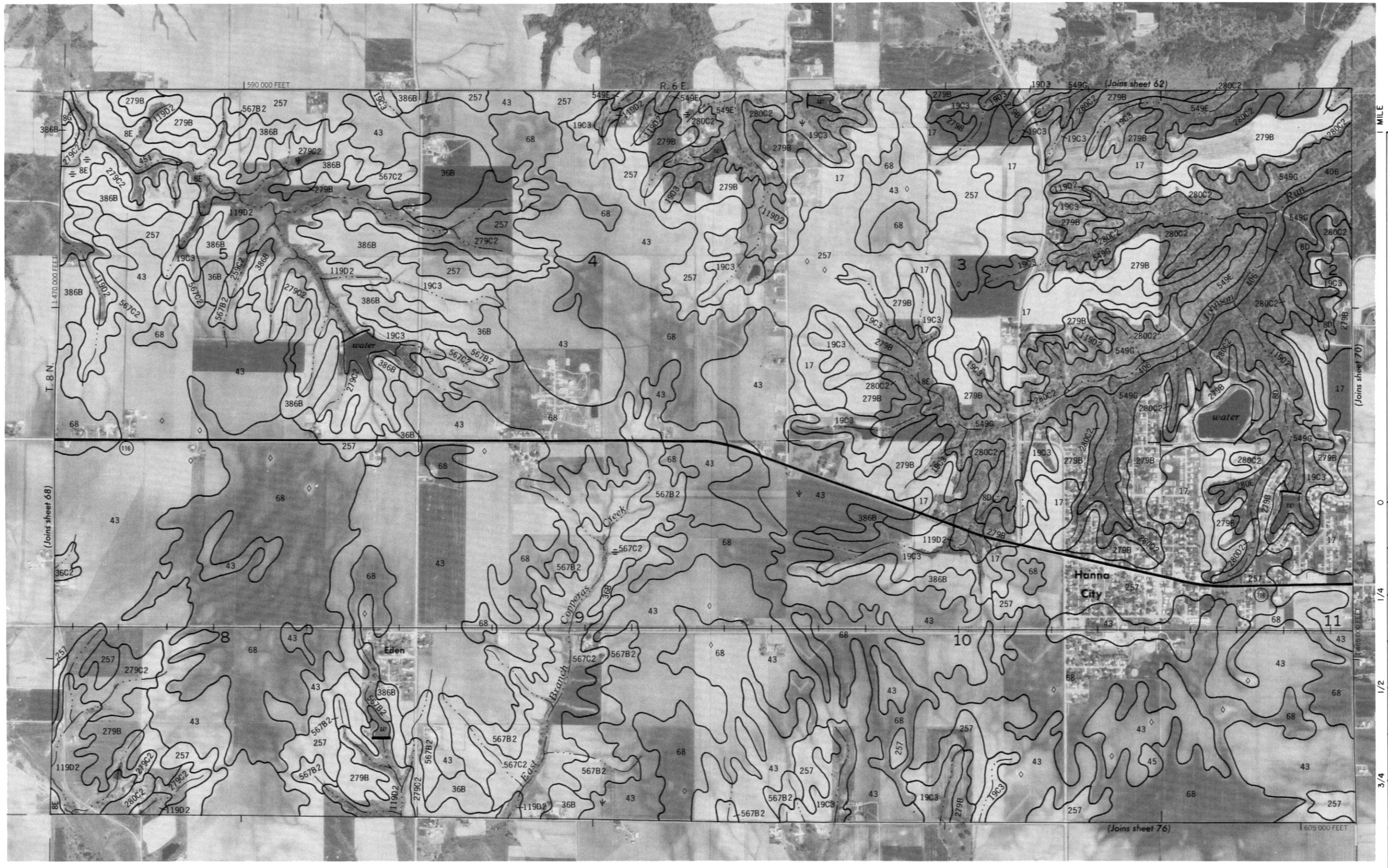
MILE

KILOMETER

Scale 1:15 840

0 0 1/4 0.5 1/2 1 3/4 1


68
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1/4
1/2
3/4
1
(Joins sheet 61)
(Joins sheet 67)
(Joins sheet 69)
(Joins sheet 75)
R. 5 E.
R. 6 E.
T. 8 N.
1 585 000 FEET
1 470 000 FEET
1 465 000 FEET
570 000 FEET
Trivoli
water
1
2
3
6
7
10
11
12


590 000 FEET
R. 6 E.
(Joins sheet 62)
1 470 000 FEET
T. 8 N.
(Joins sheet 70)
(Joins sheet 68)
(Joins sheet 76)
605 000 FEET
water
Creek
Copperas
Branch
East
Eden
Hanna City
Run
Jamison
5
4
3
8
9
10
11
116
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
3/4
1

70

N

1 MILE

1 KILOMETER

Scale 1:15 840

0 0 1/4 0.5 1/2 1 3/4 1

(Joins sheet 63)

R. 6 E. | R. 7 E.

620 000 FEET

1 470 000 FEET

T. 8 N.

(Joins sheet 71)

(Joins sheet 69)

(Joins sheet 77)

1 465 000 FEET

1 460 000 FEET

Johnson Run

Creek

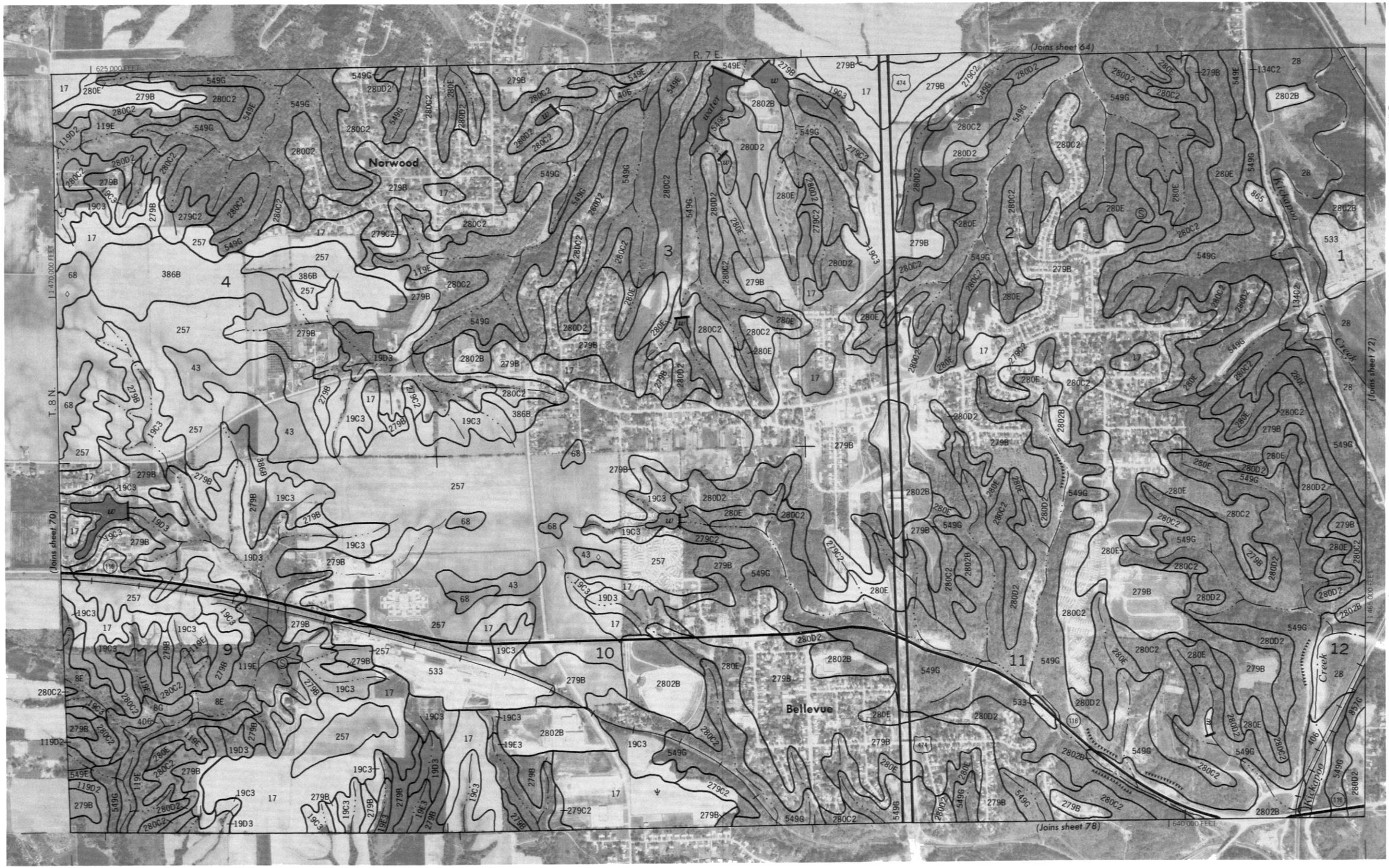
Branch

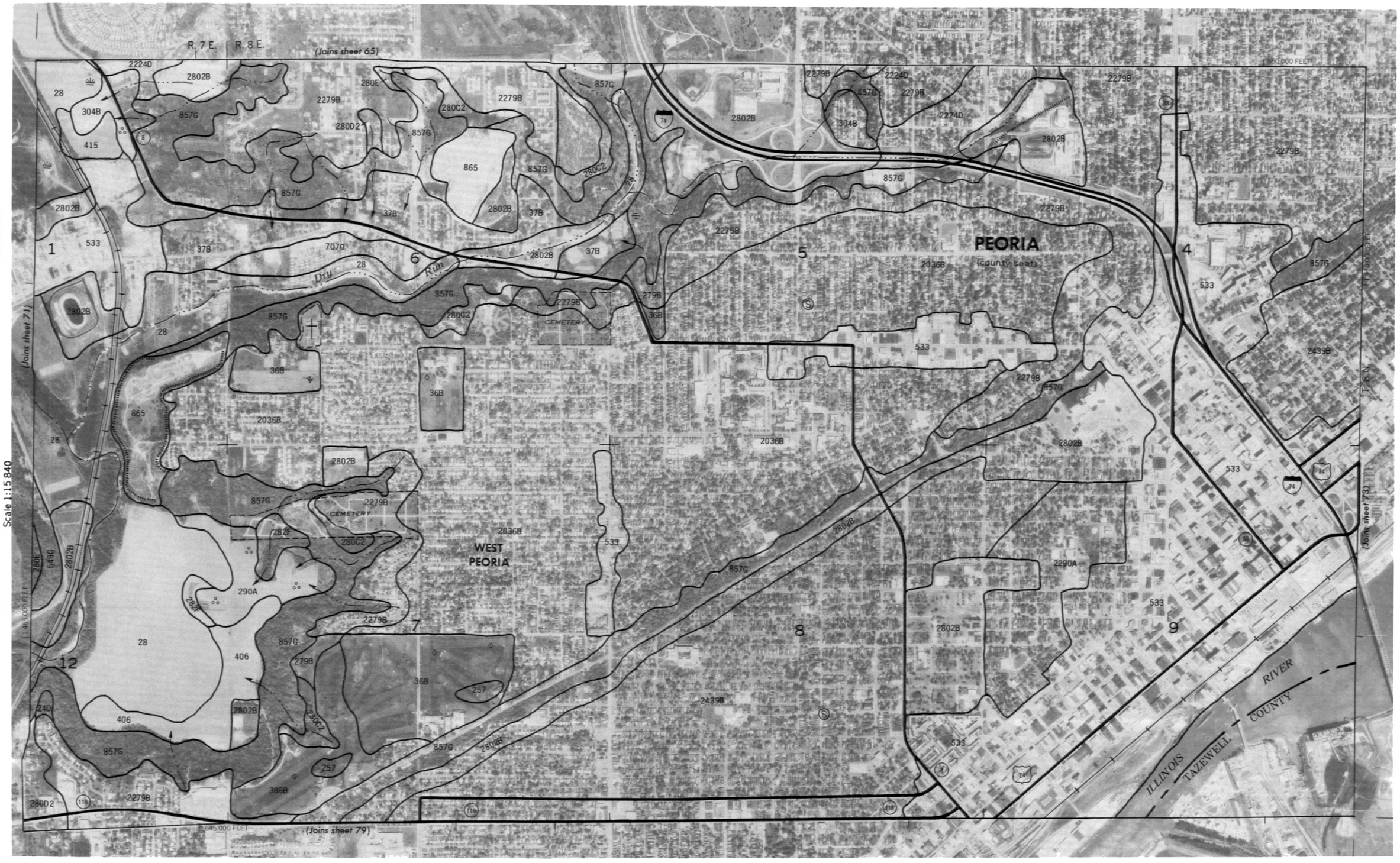
Branch

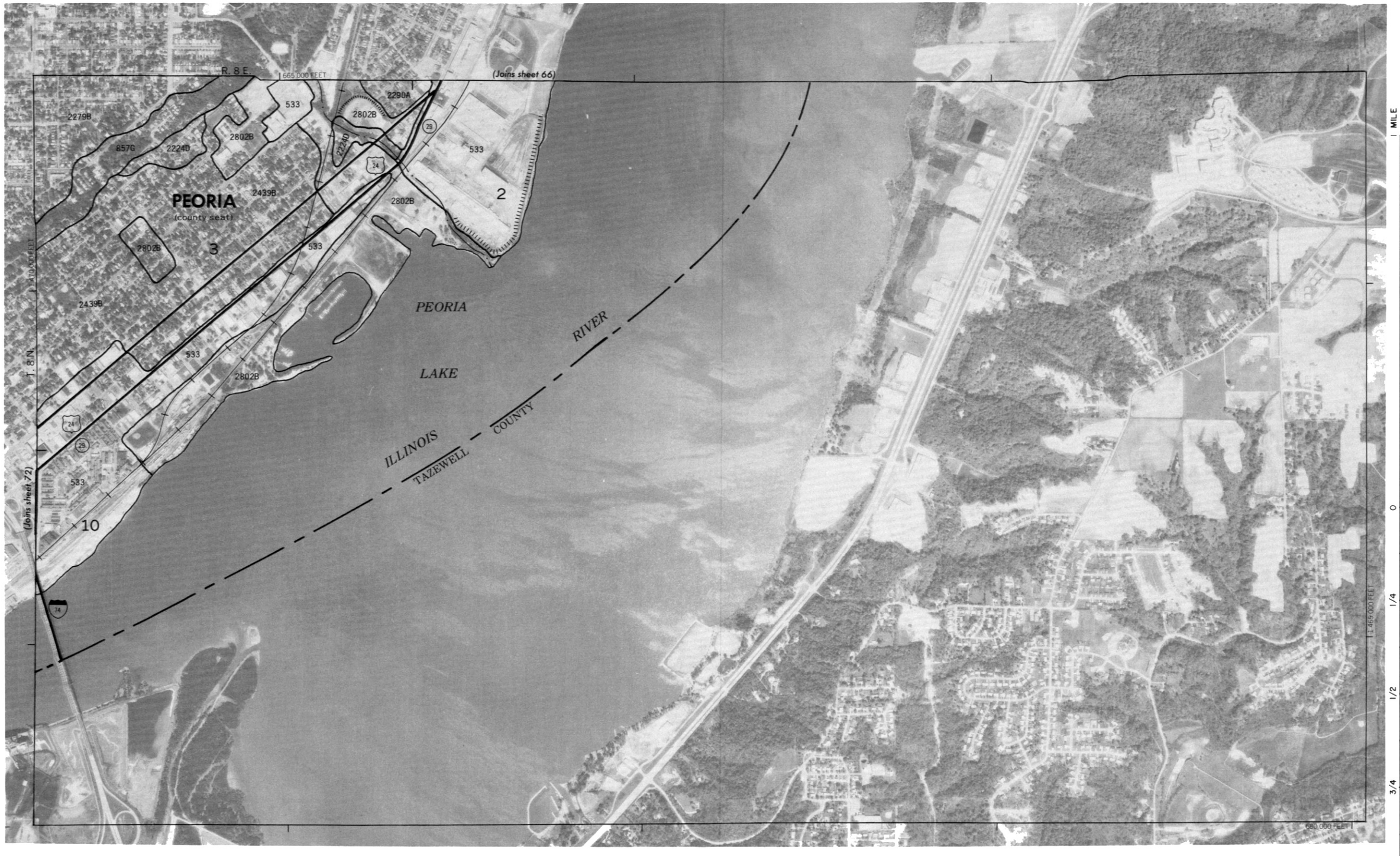
116

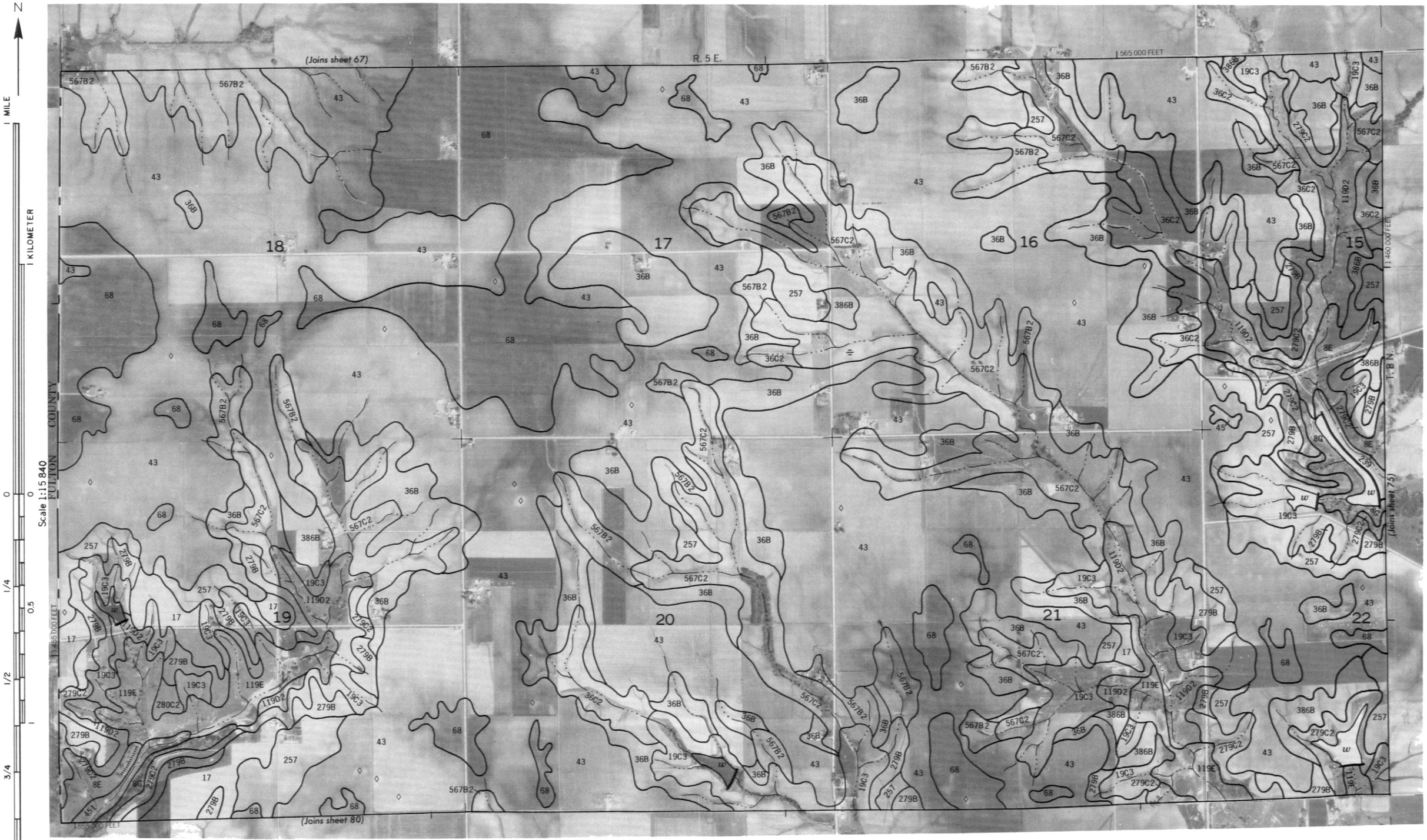
116

1 2 5 6 7 8 11 12


R. 7 E.
T. 8 N.
625 000 FEET
1 470 000 FEET
1 465 000 FEET
1 640 000 FEET
(Joins sheet 64)
(Joins sheet 70)
(Joins sheet 72)
(Joins sheet 78)
Norwood
Bellevue
Kickapoo Creek
Kickapoo Creek
N
1 MILE
1 KILOMETER
Scale 1:15 840


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4
R. 7 E.
R. 8 E.
T. 8 N.
T. 7 N.
(Joins sheet 65)
(Joins sheet 71)
(Joins sheet 73)
(Joins sheet 79)
650 000 FEET
645 000 FEET
PEORIA
(county seat)
WEST PEORIA
CEMETERY
Dry Run
ILLINOIS
TAZEWELL
COUNTY
RIVER
1
4
5
6
7
8
9
12
2224D
2802B
280E
2279B
280C2
280D2
857G
304B
415
865
37B
7070
533
36B
2036B
280F
549G
290A
406
257
386B
2439B
2290A
24D
28


R. 8 E.
665,000 FEET
(Joins sheet 66)
2279B
857G
2224D
2802B
2290A
2224D
533
2439B
PEORIA
(county seat)
3
2
T. 8 N.
410,000 FEET
PEORIA
LAKE
RIVER
ILLINOIS
TAZEWELL
COUNTY
(Joins sheet 72)
10
74
1,465,000 FEET
680,000 FEET
N
1 MILE
1 KILOMETER
Scale 1:15 840


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
1
COUNTY
FULTON
(Joins sheet 67)
R. 5 E.
565 000 FEET
1 460 000 FEET
T. 8 N.
(Joins sheet 75)
(Joins sheet 80)
1 455 000 FEET
18
17
16
15
19
20
21
22
43
68
36B
567B2
567C2
257
386B
36C2
19C3
119D2
279B
279C2
119E
280C2
8E
8G
45
451
w


570 000 FEET
R. 5 E.
R. 6 E.
(Joins sheet 68)
1 460 000 FEET
T. 8 N.
(Joins sheet 74)
(Joins sheet 76)
(Joins sheet 81)
585 000 FEET
14
15
13
18
22
23
24
19
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1
1/4
1/2
3/4

76

N

1 MILE

1 KILOMETER

Scale 1:15 840

0 0 1/4 0.5 1/2 1 3/4

(Joins sheet 69)

R. 6 E.

605 000 FEET

460 000 FEET

T. 8 N.

(Joins sheet 75)

(Joins sheet 77)

(Joins sheet 82)

590 000 FEET

Smithville

Copnolis

Branch

Ext st

16

17

15

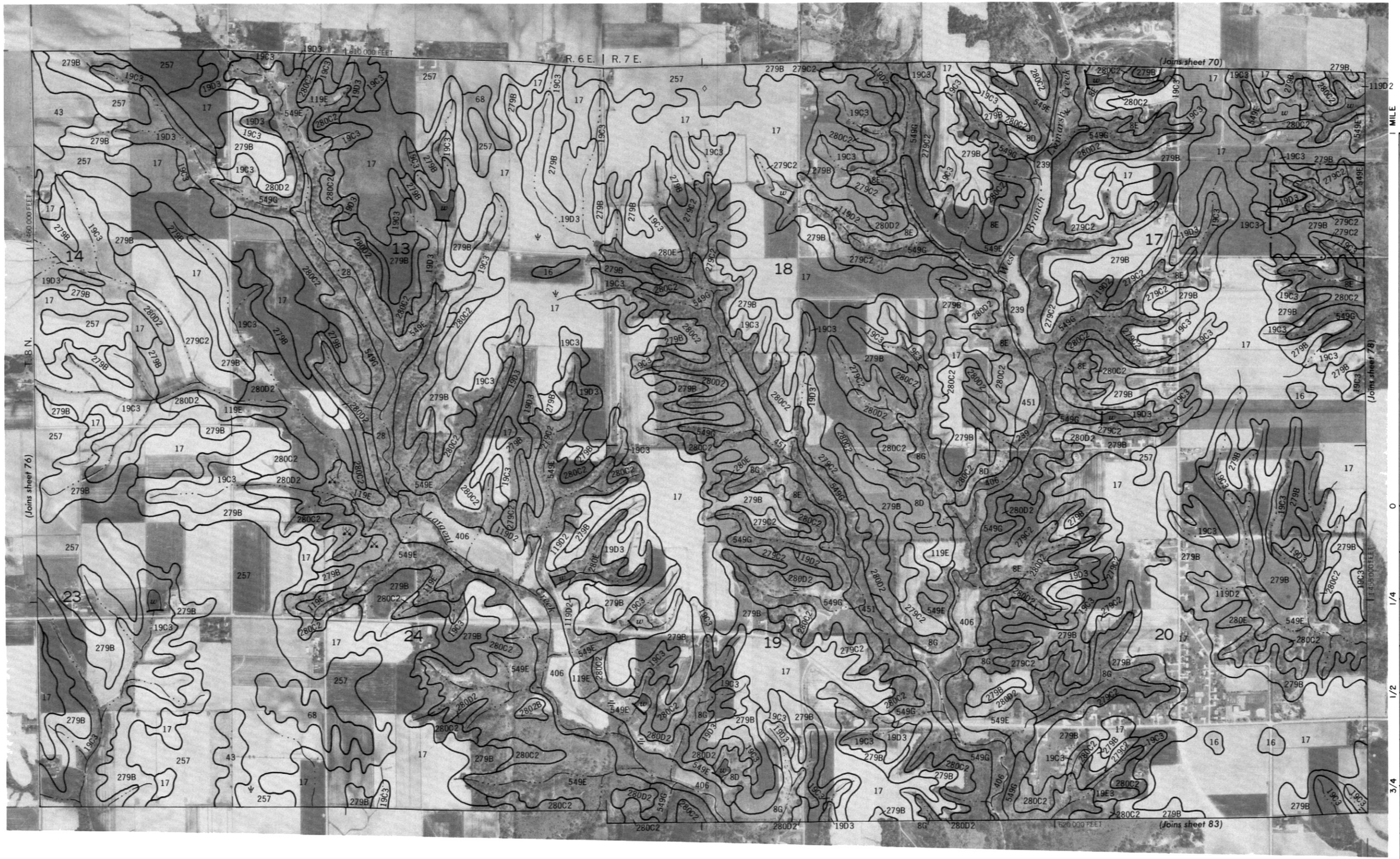
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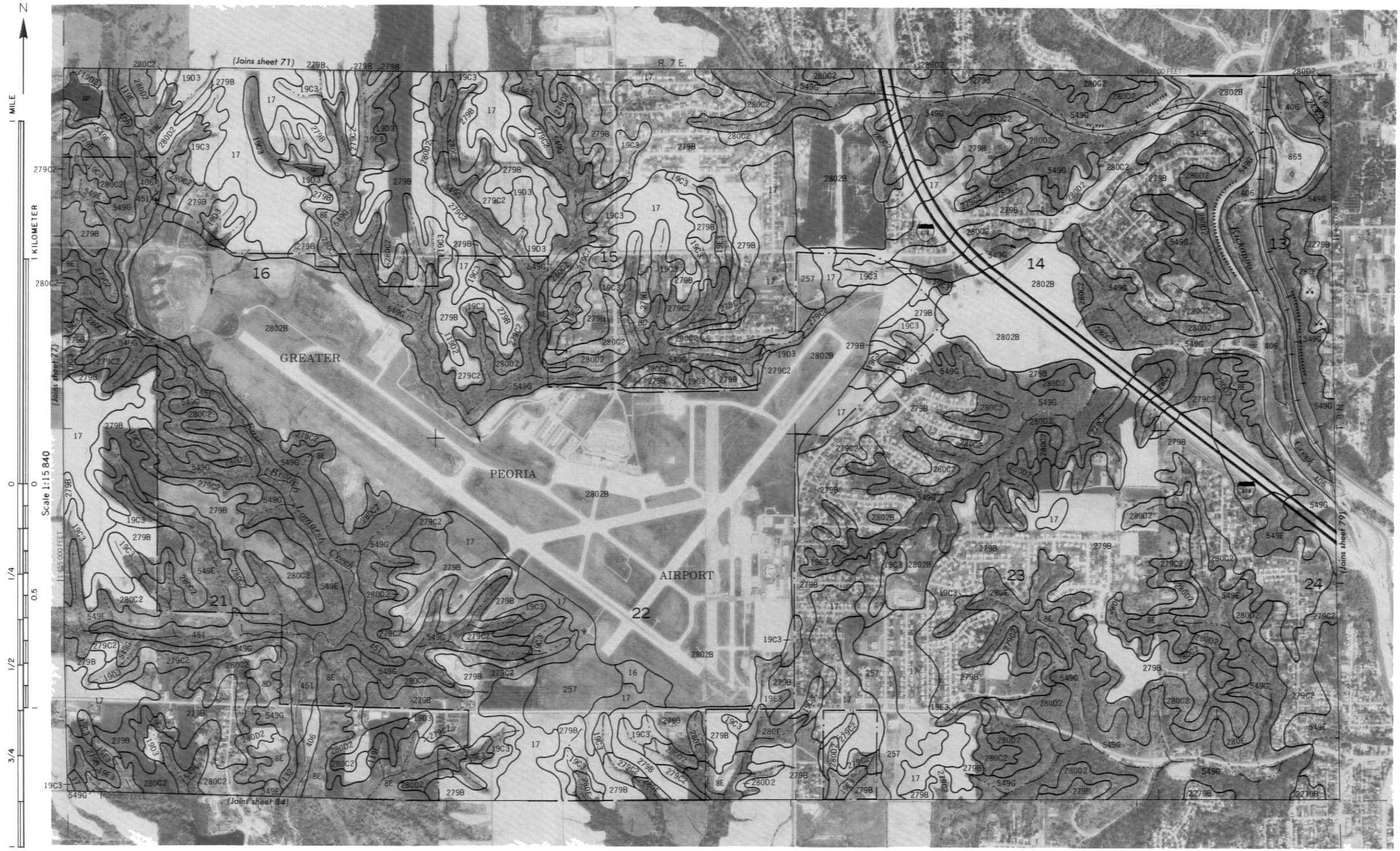
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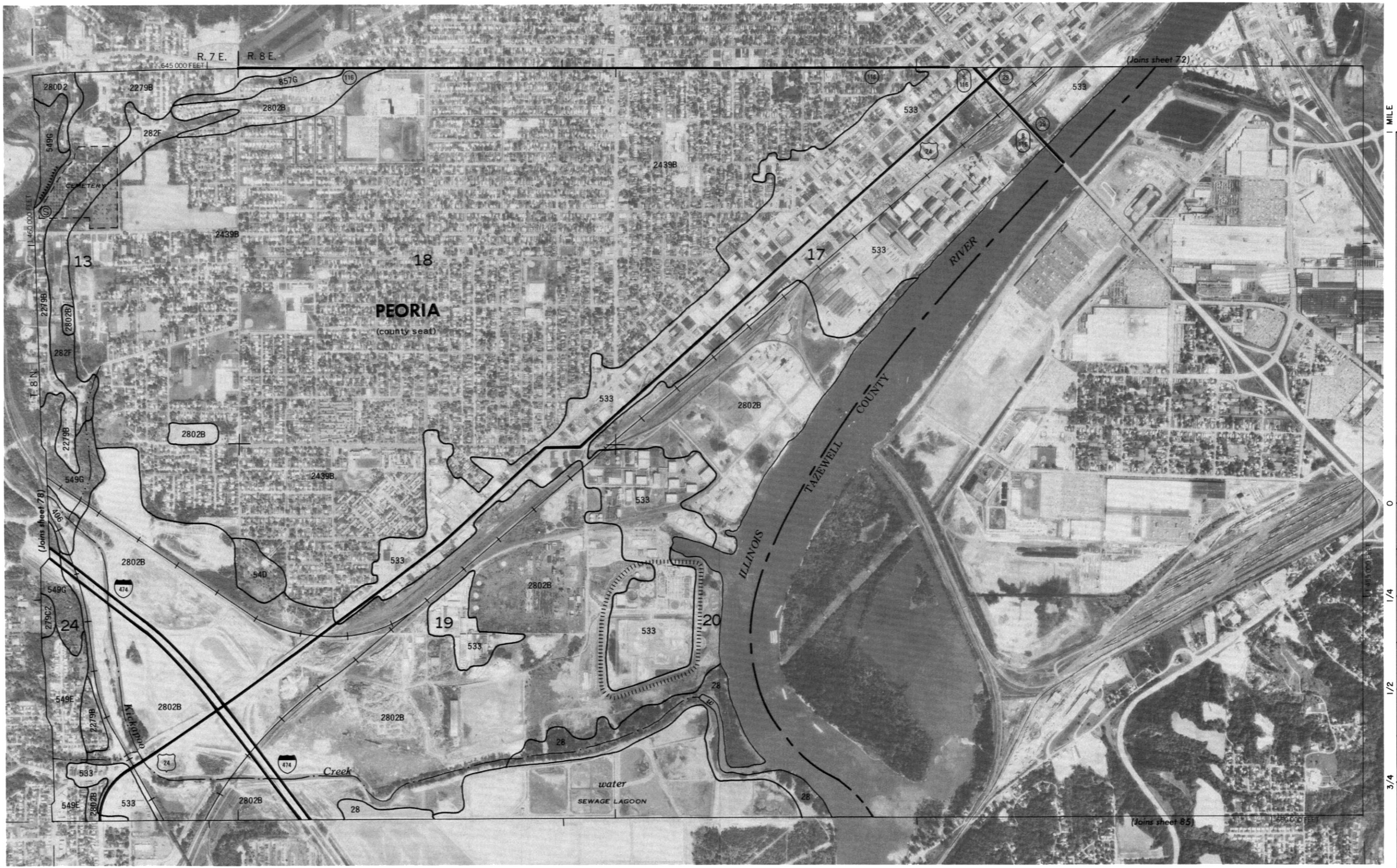
20

22

23


R. 6 E.
R. 7 E.
T. 8 N.
1 610 000 FEET
1 460 000 FEET
1 620 000 FEET
(Joins sheet 70)
(Joins sheet 76)
(Joins sheet 78)
(Joins sheet 83)
Farmers Fork Creek
West Branch
Largent
13
14
17
18
19
20
23
24
1 MILE
1 KILOMETER
1 455 000 FEET
Scale 1:15 840


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1/4
1/2
3/4
1
(Joins sheet 71)
(Joins sheet 77)
(Joins sheet 84)
(Joins sheet 79)
R. 7 E.
16
15
14
13
21
22
23
24
GREATER
PEORIA
AIRPORT
Kickapoo Creek
Farm Creek (Bryant Lowarsh Ditch)
280C2
279B
19D3
19C3
280D2
279C2
549G
549E
2802B
280E
257
451
406
865


R. 7 E.
R. 8 E.
645 000 FEET
460 000 FEET
(Joins sheet 72)
(Joins sheet 78)
(Joins sheet 85)
T 8 N
PEORIA
(county seat)
CEMETERY
RIVER
COUNTY
ILLINOIS
TAZEWELL
Kickapoo
Creek
water
SEWAGE LAGOON
13
18
17
19
20
24
2802B
2439B
533
549G
549E
2279B
282F
280D2
857G
279C2
54D
28
116
474
24
29
N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1/4
1/2
3/4
1

80

N

1 MILE

1 KILOMETER

COUNTY

Scale 1:15 840

FULTON

0 0.5 1

1/4 1/2 3/4

(Joins sheet 74)

R. 5 E.

565 000 FEET

T 8 N.

(Joins sheet 81)

550 000 FEET

FULTON COUNTY


570 000 FEET
R. 5 E.
R. 6 E.
(Joins sheet 75)
T. 8 N.
1 445 000 FEET
26
25
30
27
35
36
31
34
Copperas Creek
East Branch
Tibur
FULTON COUNTY
(Joins sheet 80)
(Joins sheet 82)
(Joins sheet 86)
1 585 000 FEET
279B
279C2
280C2
19C3
119D2
8E
8G
257
451
239
406
17
68
MILE
KILOMETER
Scale 1:15 840

82

N

1 MILE

1 KILOMETER

Scale 1:15 840

0 0.5 1

1/4 1/2 3/4

(Joins sheet 76)

R. 6 E.

605 000 FEET

(Joins sheet 81)

(Joins sheet 83)

(Joins sheet 87)

1 455 000 FEET

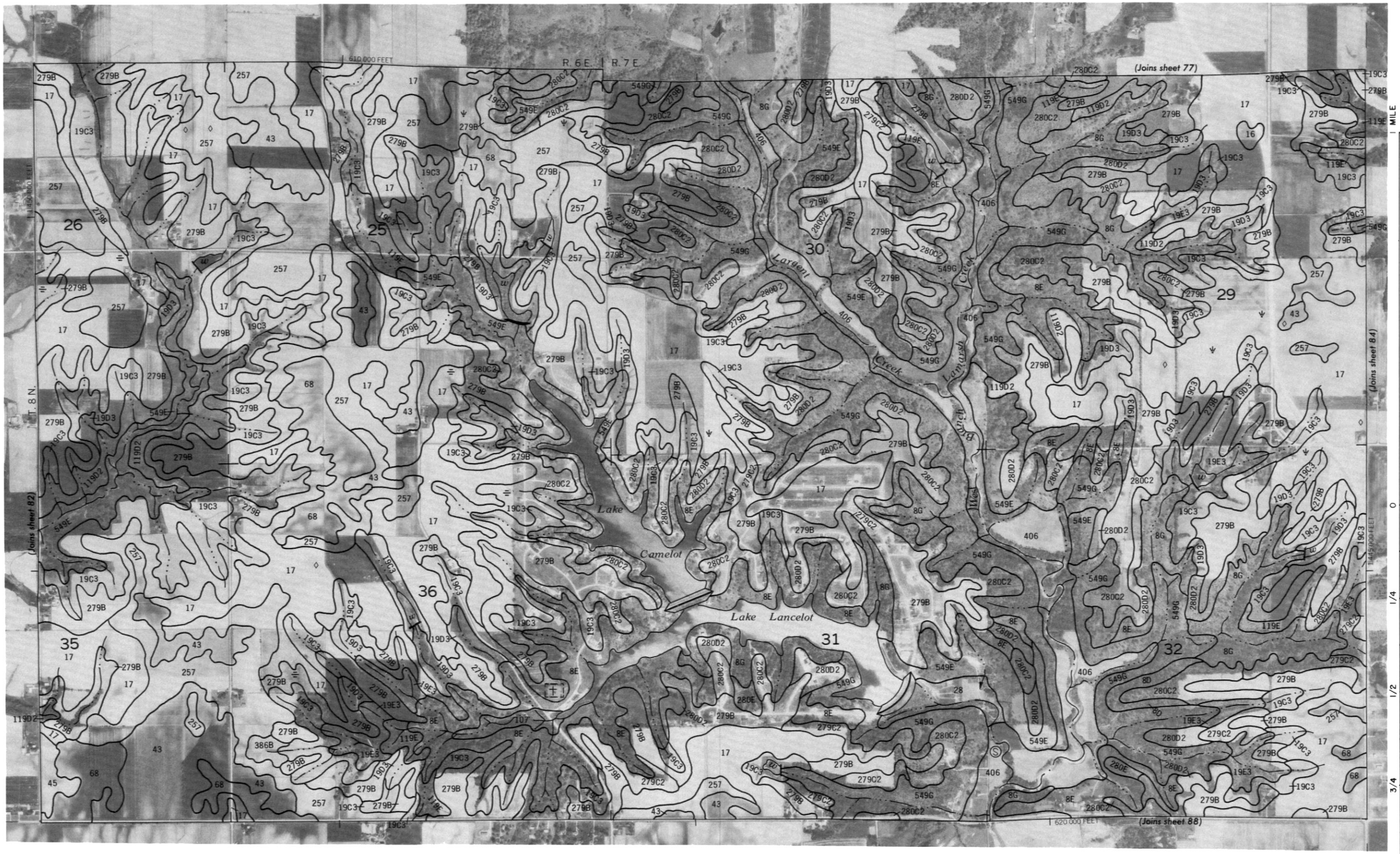
1 590 000 FEET

8 N.

Copperas Creek

East Branch

29 28 27 26 32 33 34 35



83

N

1 MILE

1 KILOMETER

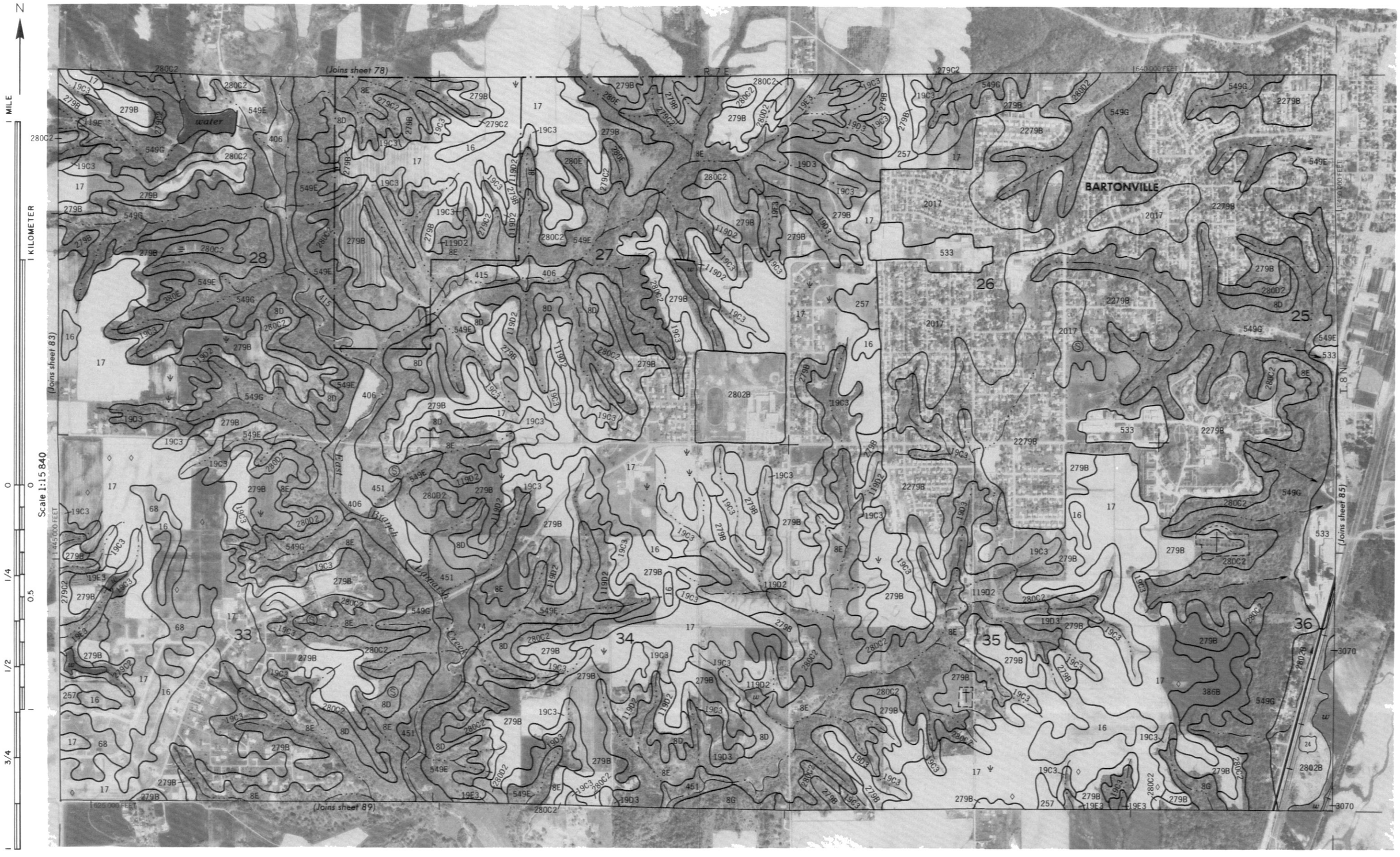
Scale 1:15 840

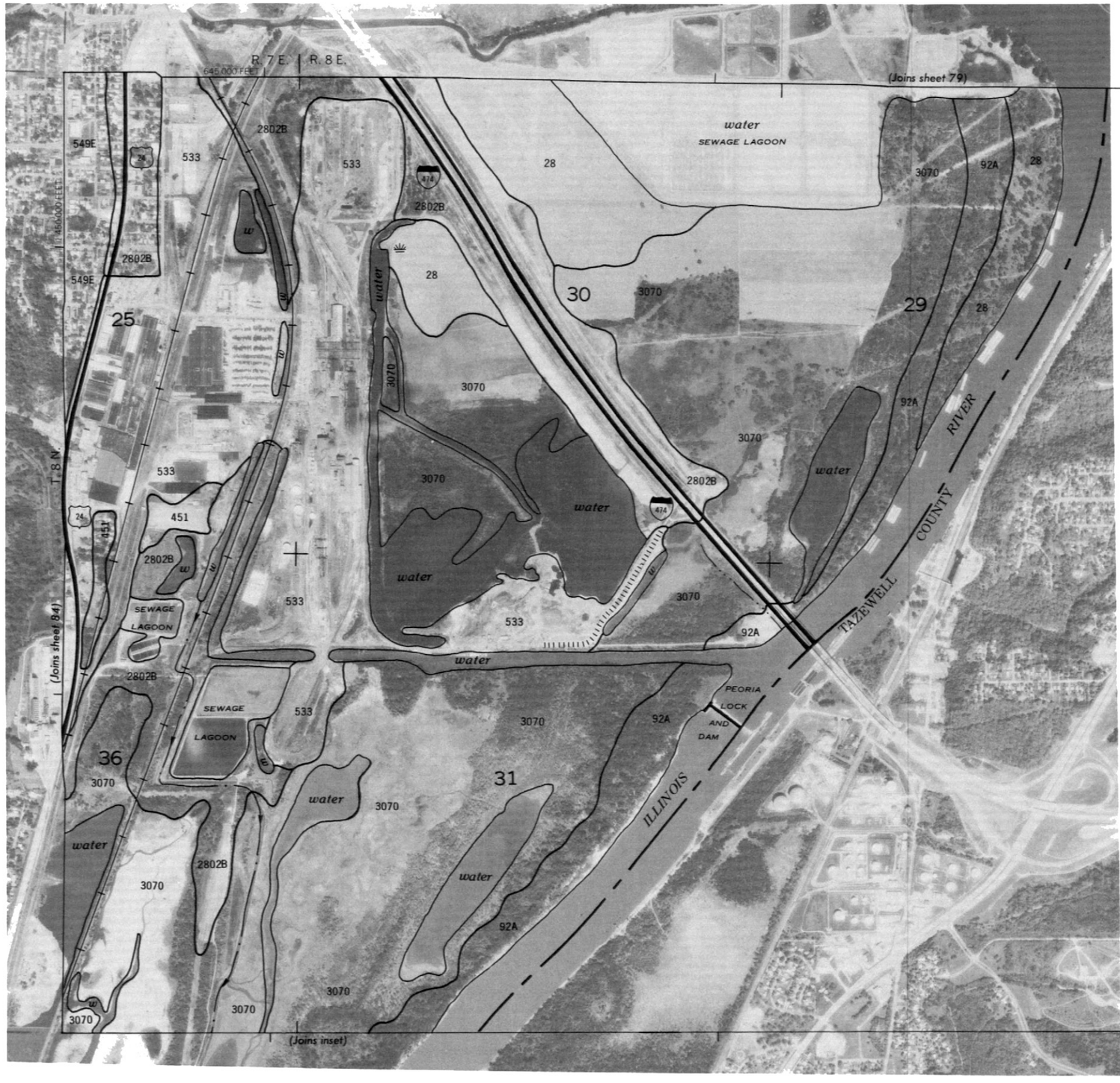
0 0

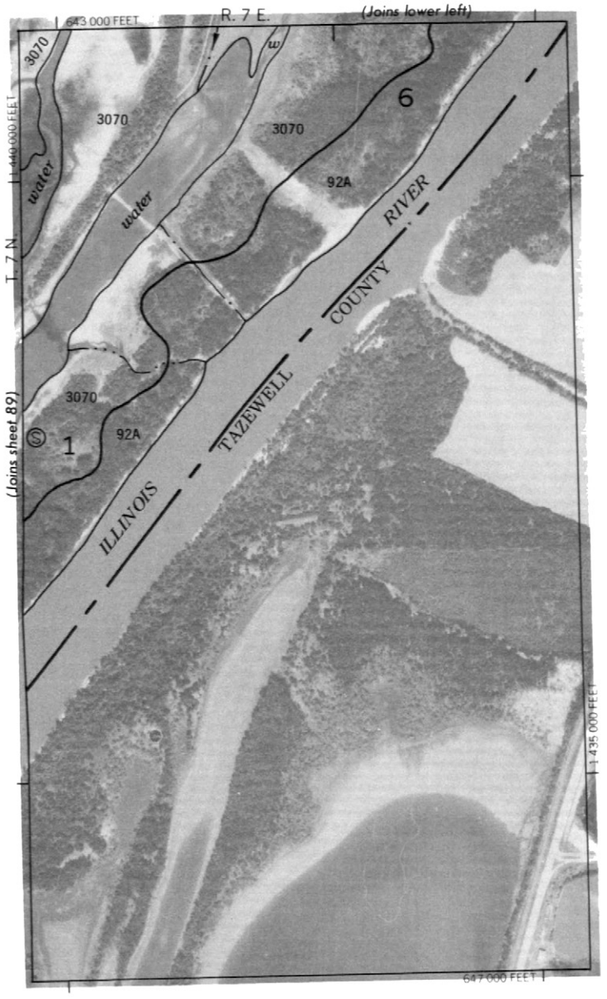
1/4 0.5

1/2 1

3/4


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0.5
1/4
1/2
3/4
1
1 445 000 FEET
625 000 FEET
1 540 000 FEET
1 460 000 FEET
T. 8 N.
R. 7 E.
(Joins sheet 78)
(Joins sheet 83)
(Joins sheet 89)
(Joins sheet 85)
BARTONVILLE
water
Spoon Branch
Copperas Creek
27
28
26
25
34
33
35
36
2802B
3070
533
2017
2279B
549G
549E
280C2
279B
19C3
119D2
280D2
8D
8E
406
415
451
257
16
17





4000 AND 5000-FOOT GRID TICKS

660 000 FEET

85

N

1 MILE

1 KILOMETER

0 0

1/4 0.5

1/2

3/4

Scale 1:15 840

86

N

MILE

KILOMETER

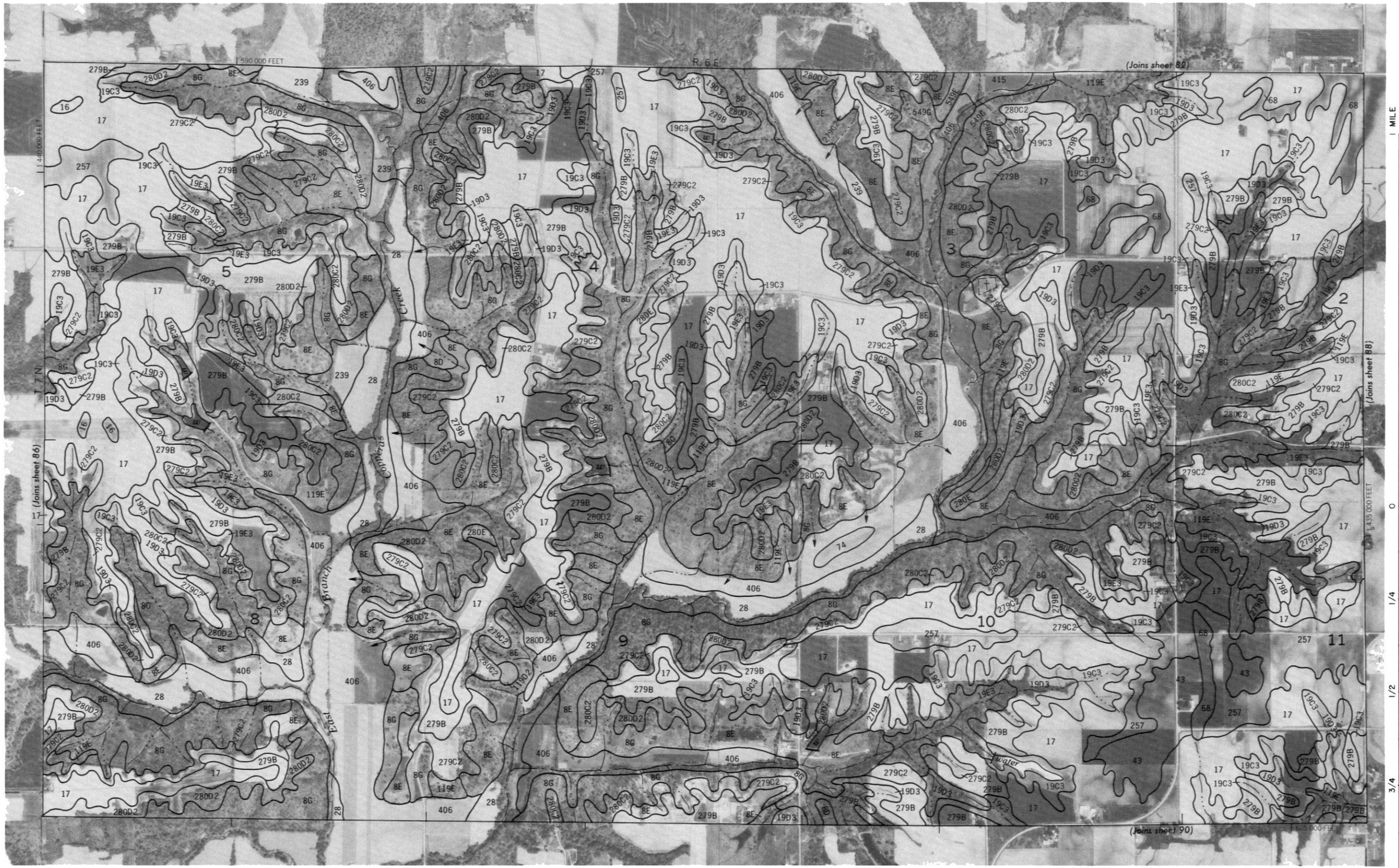
Scale 1:15 840

0 0 0.5 1/2 1/4 3/4 1





3000 AND 5000-FOOT GRID TICKS


590,000 FEET
R. 6 E.
(Joins sheet 82)
440,000 FEET
T. 7 N.
(Joins sheet 86)
(Joins sheet 88)
435,000 FEET
(Joins sheet 90)
625,000 FEET
Copperas Creek
East Branch
Quarter
1 2 3 4 5 8 9 10 11
279B 280D2 279C2 280C2 19C3 19D3 19E3 8G 8E 406 239 257 17 28 119E 43 68 415 549G
87
N
1 MILE
1 KILOMETER
Scale 1:15 840
0 1/4 0.5 1/2 3/4 0

88

N

Scale 1:15 840

1 MILE 0 1/4 1/2 3/4 1

1 KILOMETER 0 0.5 1

1 435 000 FEET

(Joins sheet 83)

(Joins sheet 87)

(Joins sheet 91)

(Joins sheet 89)

R. 6 E. | R. 7 E.

T. 7 N.

1 620 000 FEET

1 440 000 FEET

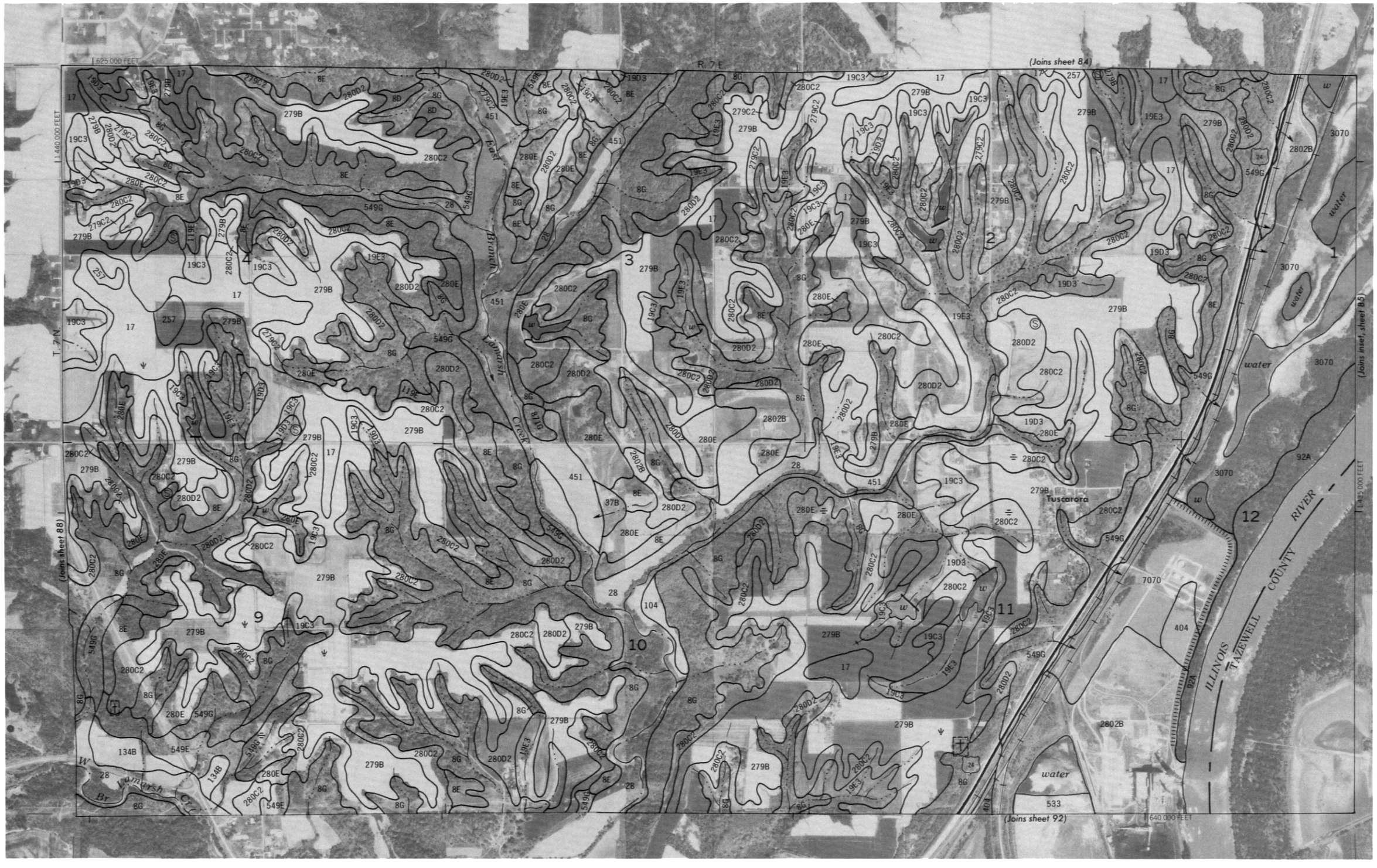
1 510 000 FEET

Little Lamarsh Creek

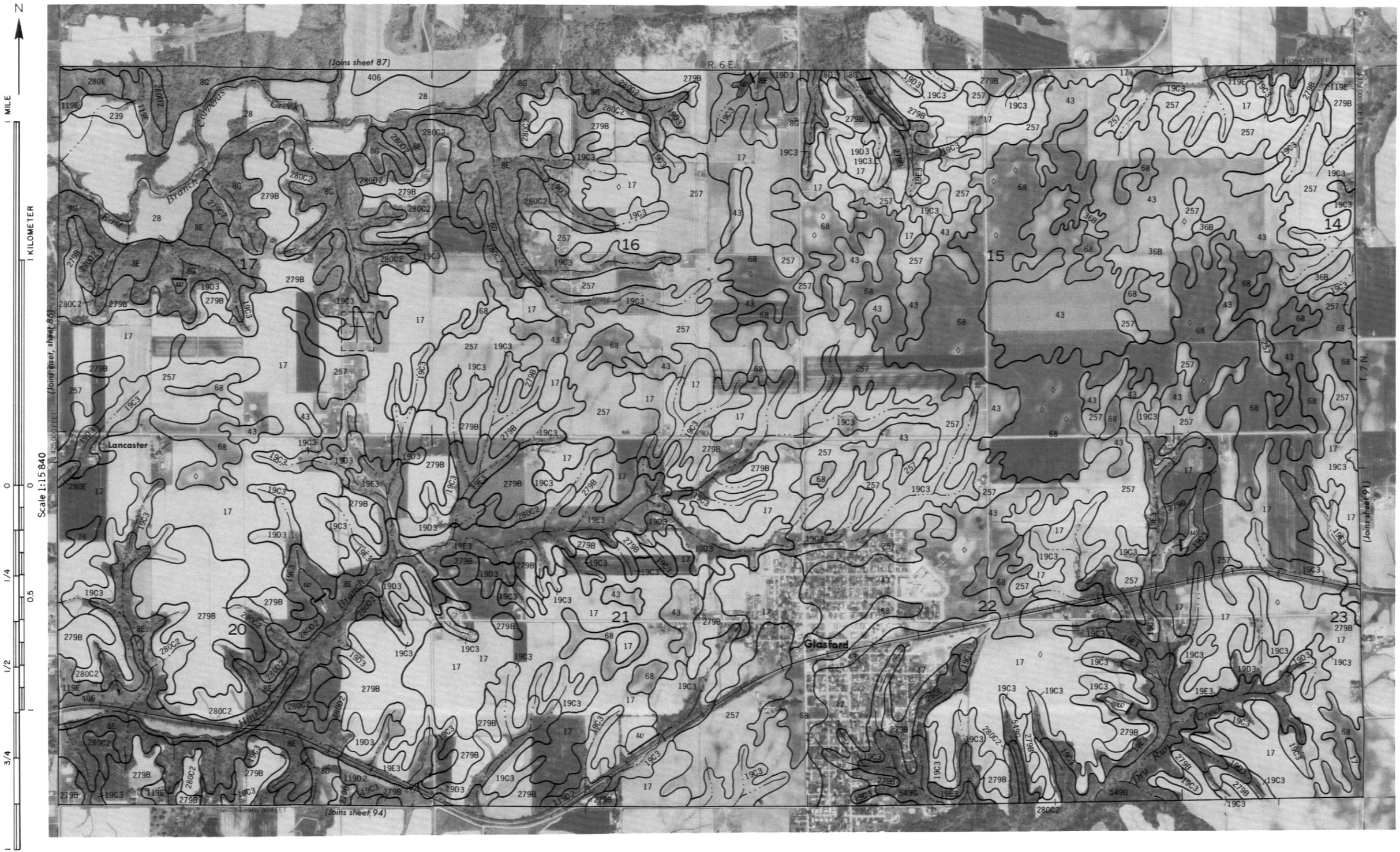
West Branch Lamarsh Creek

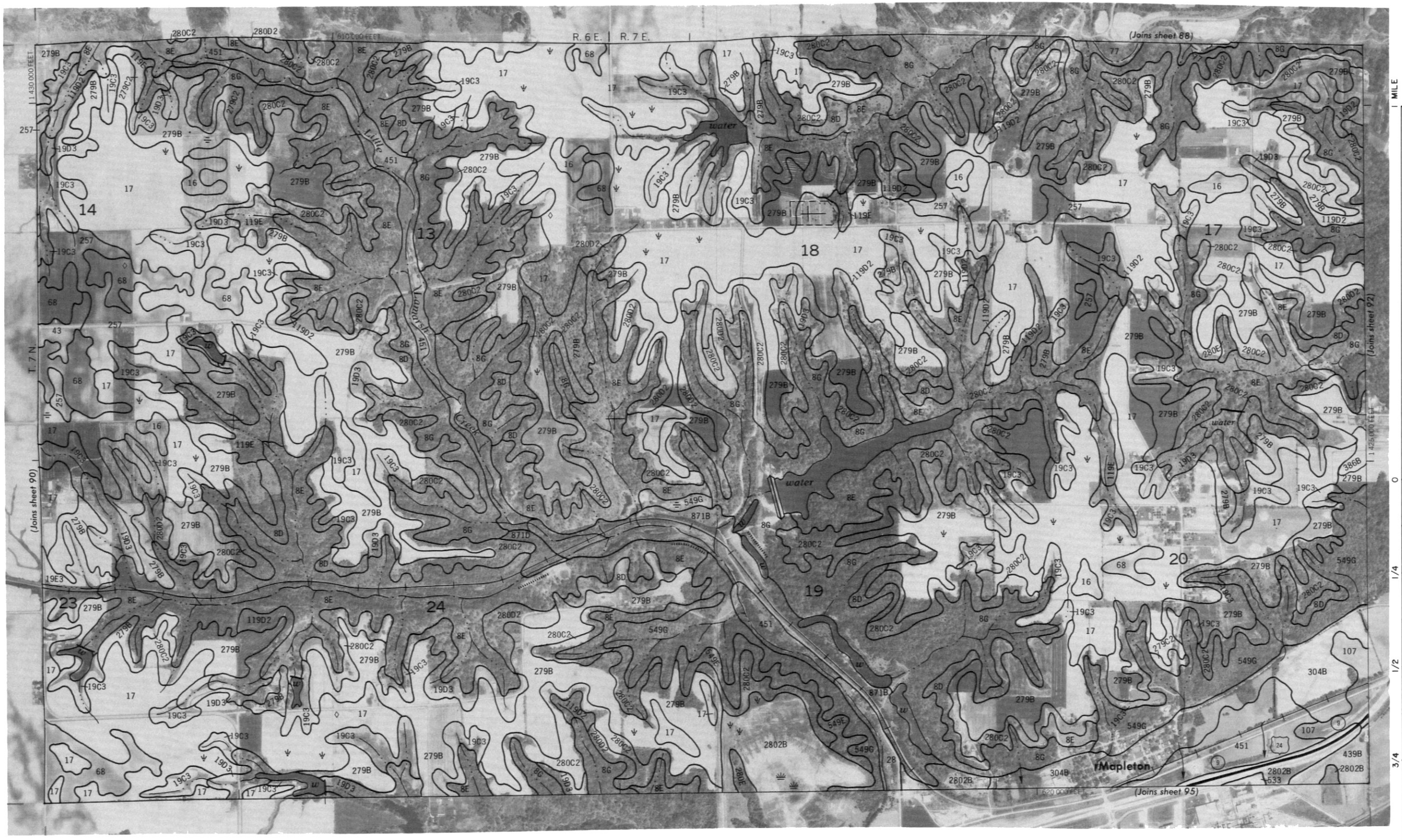
water

89

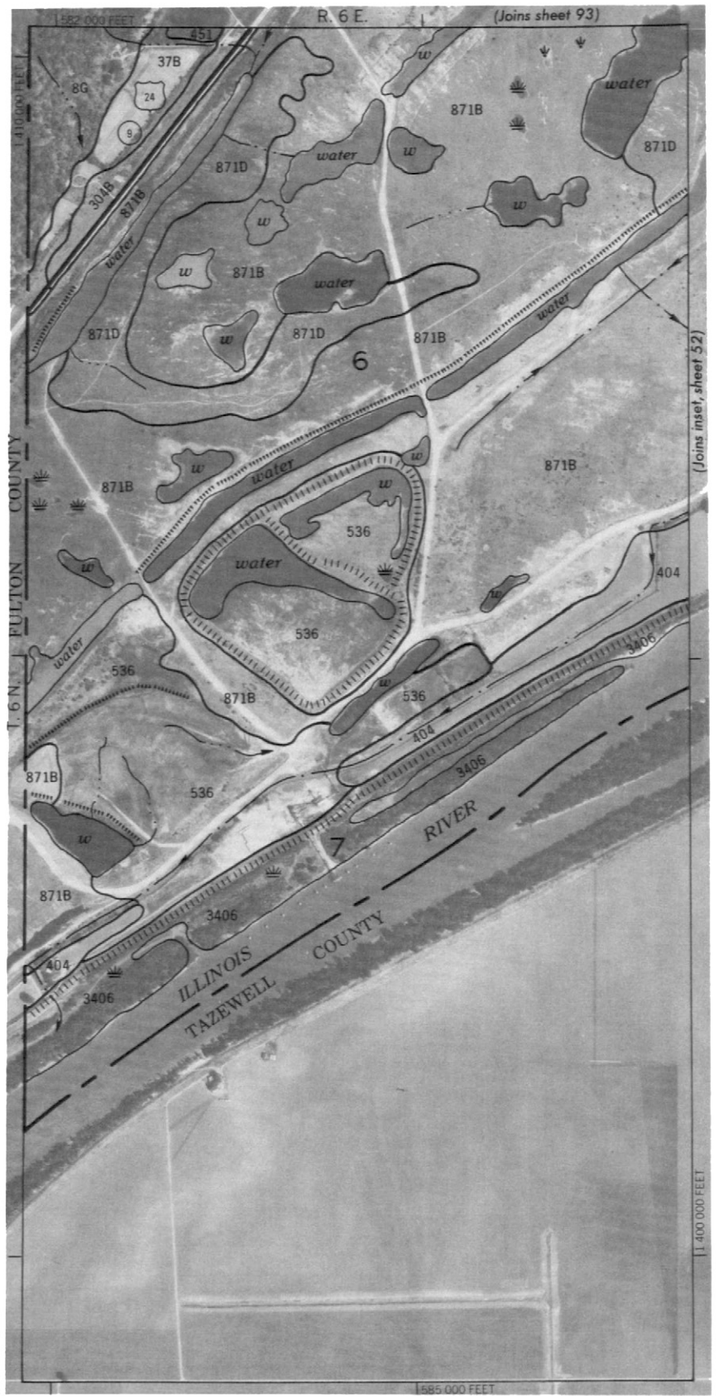

625 000 FEET
1 440 000 FEET
R. 7 E.
T. 7 N.
(Joins sheet 84)
(Joins inset, sheet 85)
(Joins sheet 88)
(Joins sheet 92)
1 435 000 FEET
1 640 000 FEET
East Branch Lamarsh Creek
Lamarsh Br
Tuscarora
ILLINOIS
TAZEWELL
COUNTY
RIVER
water
279B
280C2
280D2
280E
19C3
19D3
19E3
8E
8G
549G
2802B
3070
7070
404
92A
92M
134B
549E
533
451
257
w
1 MILE
1 KILOMETER
Scale 1:15 840
0
1/4
0.5
1/2
3/4
N

90


N
MILE
KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
1
(Joins sheet 87)
R. 6 E.
(Joins sheet 86)
(Joins sheet 94)
(Joins sheet 91)
T. 7 N.
Lancaster
Glasford
Coppers Creek
Branch
Hunt
Dry Run Creek
16
17
15
14
20
21
22
23


R. 6 E.
R. 7 E.
T. 7 N.
(Joins sheet 88)
(Joins sheet 90)
(Joins sheet 92)
(Joins sheet 95)
1,430,000 FEET
610,000 FEET
620,000 FEET
1,425,000 FEET
Little Spoon Creek
water
Mapleton
14
13
18
17
23
24
19
20
1 MILE
1 KILOMETER
Scale 1:15 840
N
91


(Joins sheet 89)
R. 7 E
T. 7 N.
1 640 000 FEET
1 430 000 FEET
Lamarsh Creek
West Branch
Lamarsh Creek East
Orchard Mines
water
RIVER
TAZEWELL COUNTY
ILLINOIS
16
15
14
13
21
22
23
24
(Joins sheet 91)
(Joins sheet 96)
625 000 FEET
1 425 000 FEET
Scale 1:15 840
1 MILE
1 KILOMETER
N
0
0.5
1/4
1/2
3/4
1



3000 AND 5000-FOOT GRID TICKS



3000 AND 5000-FOOT GRID TICKS

93

N

MILE

KILOMETER

Scale 1:15 840

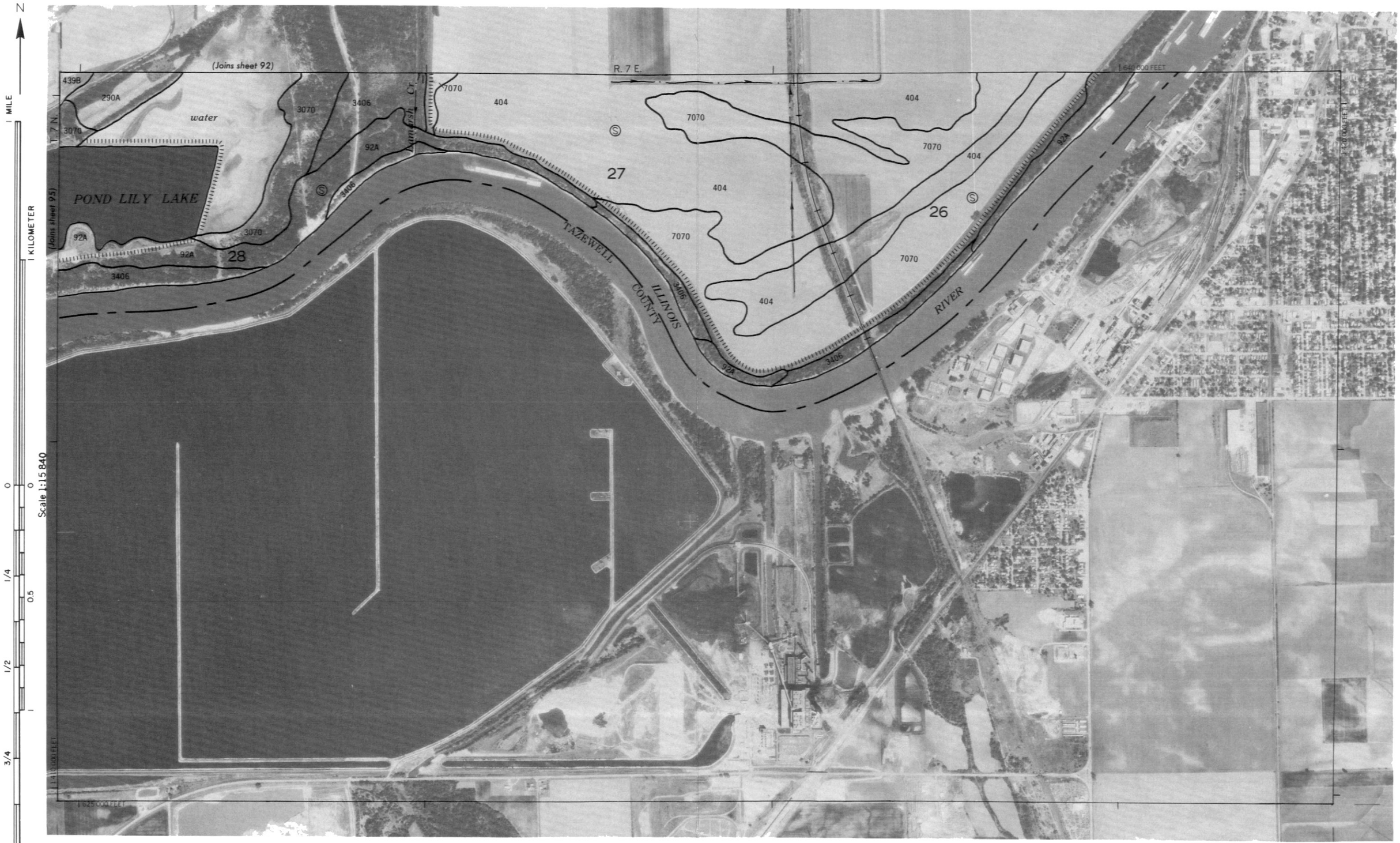
0 1/4 0 0.5

1/2 1

3/4


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
(Joins sheet 90)
(Joins sheet 93)
R. 6 E.
T. 6 N.
605 000 FEET
590 000 FEET
(Joins inset, sheet 52)
(Joins sheet 95)
Peyton Creek
Dry
Water
RIVER
ILLINOIS
TAZEWELL COUNTY
water
26
27
28
29
32
33
34
35


95
N
1 MILE
1 KILOMETER
Scale 1:15 840
R 6 E.
R 7 E.
T 7 N.
610 000 FEET
620 000 FEET
(Joins sheet 91)
(Joins sheet 94)
(Joins sheet 96)
Kingston Mines
Lamotte Creek
POND LILY LAKE
water
ILLINOIS
RIVER
TAZEWELL
COUNTY
25
26
29
30


N
1 MILE
1 KILOMETER
Scale 1:15 840
0
0
1/4
0.5
1/2
1
3/4
1
(Joins sheet 92)
(Joins sheet 95)
T. 7 N.
R. 7 E.
1 640 000 FEET
1 625 000 FEET
439B
290A
water
3070
3406
92A
7070
404
POND LILY LAKE
27
28
26
TAZEWELL COUNTY
ILLINOIS
RIVER
Lamish Cr.